

3 Current and Future Transportation Facilities and Conditions

The purpose of this chapter is to identify and document the transportation facilities and services in the southwest portion of the Phoenix Metropolitan area. The chapter examines the current and expected conditions of transportation facilities in the study of the Southwest Area Transportation Study. The purpose of this chapter is to inform the development of the Regional Transportation Plan for the greater Phoenix area. The conclusions of this chapter form the foundation for the identification of new transportation facilities and services needed in the southwest valley to meet the future demands of the area.

This chapter was developed as a Working Paper (WP) and contains data and information that is continuously updated, some of which may have changed or may have been superseded by the final Regional Transportation Plan (RTP). Information was current at the time of initial WP publication.

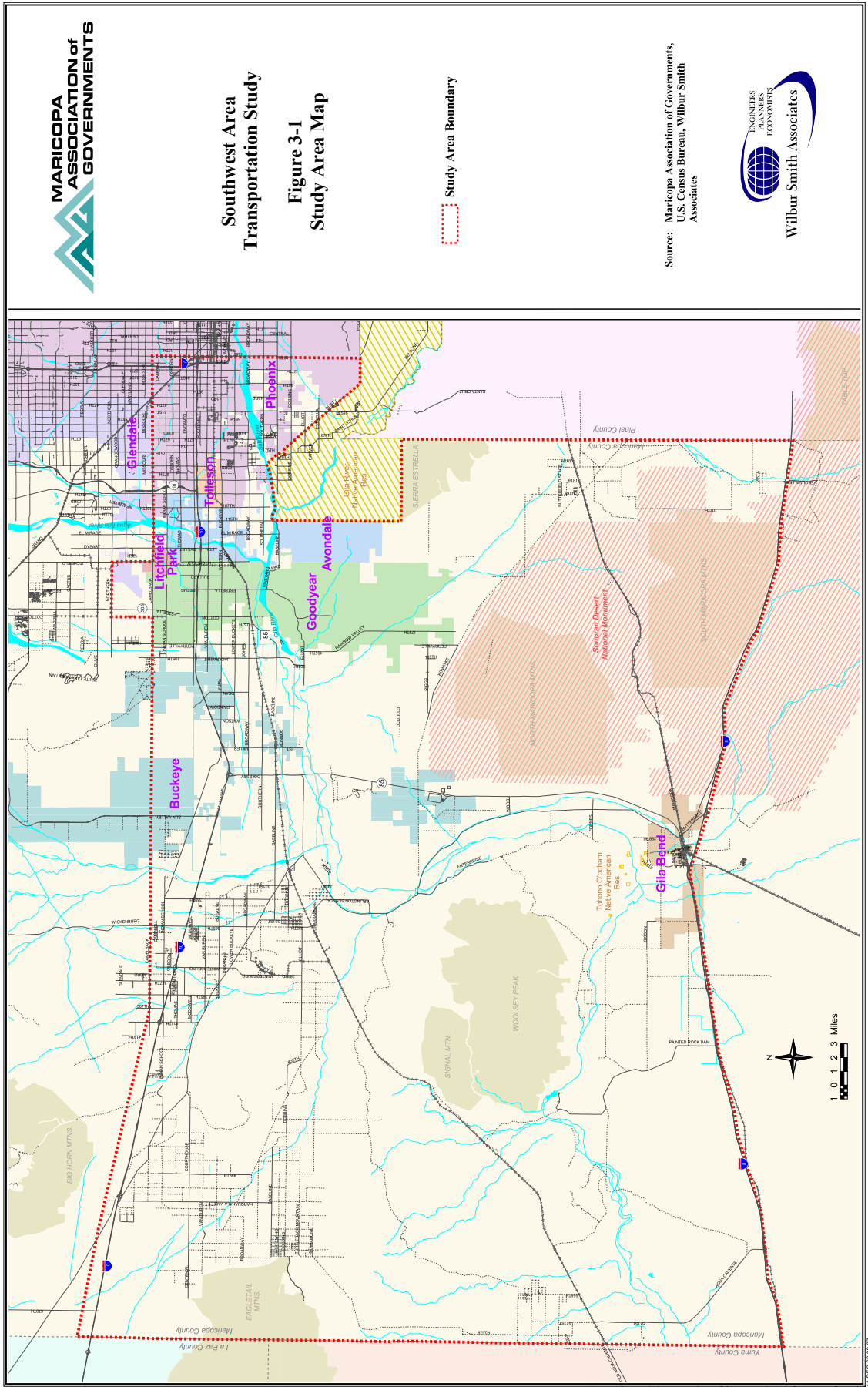
The area included in the SWATS is shown in Figure 3-1. The study area is bounded on the west by the Maricopa County line. From the western county line, it is bounded on the north by a line parallel to I-10, one mile to the north of that highway, until that line reaches the projected alignment of Camelback Road. The alignment of Camelback Road forms the remainder of the study area's northern boundary, except where the boundary swings north around Luke Air Force Base, which is fully included in the study area. The eastern boundary of the study area is 19th Avenue north of the Gila River Indian Community (GRIC) and the eastern boundary of Maricopa County south of the GRIC. The eastern boundary swings west around the GRIC, which is fully outside the study area. The southern boundary of the study area is I-8.

Much of this study area is lightly populated with limited transportation services, facilities, and needs. The focus of the study effort is on the portions of the area that are more heavily populated closer to Phoenix or that are expected to experience population growth in the next 50 years such that improved transportation facilities and services will be required.

This chapter identifies the transportation facilities and services currently in the study area and evaluates their levels of use. The chapter also identifies an assumed set of future transportation facilities and services based on the Long Range Transportation Plan and other documents and information and referred to hereafter as the future LRTP based transportation system. Forecasts of their levels of use at two future "horizon" years: 2020 and 2030.

Of the 3.2 million metropolitan population, just under 0.4 million, or about 12 percent, was in the SWATS area in 2000. The population in the SWATS area is forecast to be just over 900,000 in 2020 and represent a growing portion of the metropolitan area population. In the year 2030, the SWATS area is forecast to have over 1.4 million people, about 20 percent of the metropolitan.

In 2000 there were approximately 180,000 jobs located in the SWATS area. As the metropolitan population increases, the number of jobs in the SWATS area is expected to increase also. In the year 2020, an employment will surpass half a million. By 2030 an employment base of nearly 825,000 is expected in the SWATS area. (The forecast of the distribution of the 900,000 and 1.4 million



population within the SWATS area in 2020 and 2030, respectively, as well as the forecast of the distribution of employment, is the subject of Chapter 2, and represents an input to forecasting transportation demand in the SWATS area.)

These forecast increases in population and employment in the southwest valley will place additional demands on the transportation systems serving the area. Those demands are compared to the future LRTP based transportation system in this chapter to determine where congestion and other transportation system problems and failures can be expected to occur and at which population threshold levels.

Chapter Organization

This chapter starts with a general description of the types of transportation facilities to be examined. The sources of data about the transportation systems and their use are also described along with comments on the reliability of those data. This is followed by a detailed description of the transportation facilities in the area (current and future LRTP based) and their levels of current and expected use in the future, including a description of expected congestion and other failures of the current and future LRTP based transportation systems. A summary follows incorporating an identification of transportation problems, existing and expected. Subsequent chapters of this Final Report document tests of specific strategies and projects to address those problems and make recommendations about strategies, facilities, and services to implement.

3.1 Existing and Future Facilities and Use

This report covers the current and future conditions of three transportation modes: highways, transit, and non-motorized. The following three subsections address each of those modes respectively. The facilities and services currently available for each mode are inventoried. The facilities and services included in the future LRTP based transportation system are also inventoried and described. Major differences between the current facilities and facilities assumed in the future LRTP based system are identified.

The levels of use of the current facilities and services are described, including an identification of services and facilities whose levels of use exceed their intended operational capacity or indicate an imminent capacity problem. Levels of use are forecast for the future LRTP based transportation system and those levels are reported along with an identification of capacity problems.

A variety of sources of data were used to create the inventory of current facilities and services and their levels of use. Data were gathered from MAG, the Arizona Department of Transportation (ADOT), the Maricopa County Department of Transportation (MCDOT), the Regional Public Transportation Authority (RPTA or Valley Metro), Southwest Transit and Regional Transportation (START), local jurisdictions, and other organizations.

The sources of the data presented in this chapter are identified. The quality and reliability of the data vary. Some of the data are less than a year old and were collected by field observation. Other data are older and may be less reliable. Much of the data is derived from samples, meaning that data collected from a relatively small subset of a large group are generalized to the entire large group. Still

other data are the products of models which, by their nature, represent estimations. The limitations of the data and appropriate qualifications to its accuracy, precision, and reliability are provided in the chapter.

3.1.1 Roadways

The MAG traffic forecasting model is a primary source of information on existing and future roadway characteristics and traffic within the study area. To assess the reliability of this information, a search of relevant traffic data and limited field reconnaissance were conducted within the project area to determine how well the current network is being represented by the model.

Relevant traffic count information was received from ADOT and MCDOT. Other traffic volume sources, such as localized impact studies, were not used due to the uncertainty of the data presented. Unlike traffic volumes from ADOT and MCDOT, it was not possible to determine if other volumes were raw numbers or processed to include factors such as axle pair adjustments and seasonal variations. Therefore, only data provided from the above agencies were used when comparing model volumes to existing ground counts. The MAG transportation model has been calibrated to current conditions.

3.1.1.1 General Description

The SWATS area roadway network includes all of the state and county highways in the study area, as well as local streets in all or part of Avondale, Buckeye, Gila Bend, Glendale, Goodyear, Litchfield Park, Phoenix, Tolleson, Luke Air Force Base, and the unincorporated portions of Maricopa County. The roadway network, matching population density, is mainly concentrated in the northeasterly section of the study area. Areas to the west and south of this section are sparse in population with traffic demand accommodated mostly by minor roads servicing local needs or small traffic generating areas. Figure 3-2 provides a base map of the road network and other geographic features that exist within the study area. There are over 4,000 roadway centerline miles in the study area.

The most obvious feature of the base map is the large rural area that exists in the south and west with limited road development. Large preserve and wilderness areas are contained within the central and southern portions of the study area where both existing and projected population and employment are relatively small. Eagletail Mountain, North and South Maricopa Mountains, Signal Mountain, Woolsey Peak, Painted Rock Wildlife Area, and other public environmentally sensitive areas including desert preserve spaces and private holdings will avoid development in the foreseeable future. Roadway construction in these areas is projected to be minor, with only limited, localized new road construction. At the opposite extreme, the northeast section of the study area and the I-10 corridor are currently experiencing or are planned for major development.

Numerous housing developments in Goodyear, Avondale, Litchfield Park, and western Phoenix will soon fill vacant areas. Large scale master planned communities are planned in Avondale, Goodyear, and Buckeye as the urbanized area expands westerly along the I-10 corridor.

The resulting increased traffic demand in this area will tax the existing roadway facilities in the near future. Facilities such as I-10 are already experiencing directional rush hour congestion and poor levels of service. Pressure is growing in the impacted communities to expand the current arterial grid network, upgrade and construct new river crossings, and build and plan for high capacity roadways.

Figure 3-3 displays the current roadway network based on MAG's current year transportation model network. The major freeway serving most of the study area is I-10. The I-10 corridor runs east and west through the northern portion of the study area, providing a high capacity, high speed connection between the study area and employment centers located in downtown Phoenix, east and west Phoenix, La Paz County, and beyond. Twenty-six full or partial interchanges exist on I-10 between I-17 to the east and La Paz County to the west. In the east, interchanges are at one mile intervals until 99th Avenue. West of 99th Avenue to approximately the 303 Loop and the Cotton Lane interchange, population density decreases and I-10 interchanges are spaced further apart. West of Buckeye Valley and the Hassayampa River, the distance between interchanges further increases, predominantly serving spot developments and the rural community.

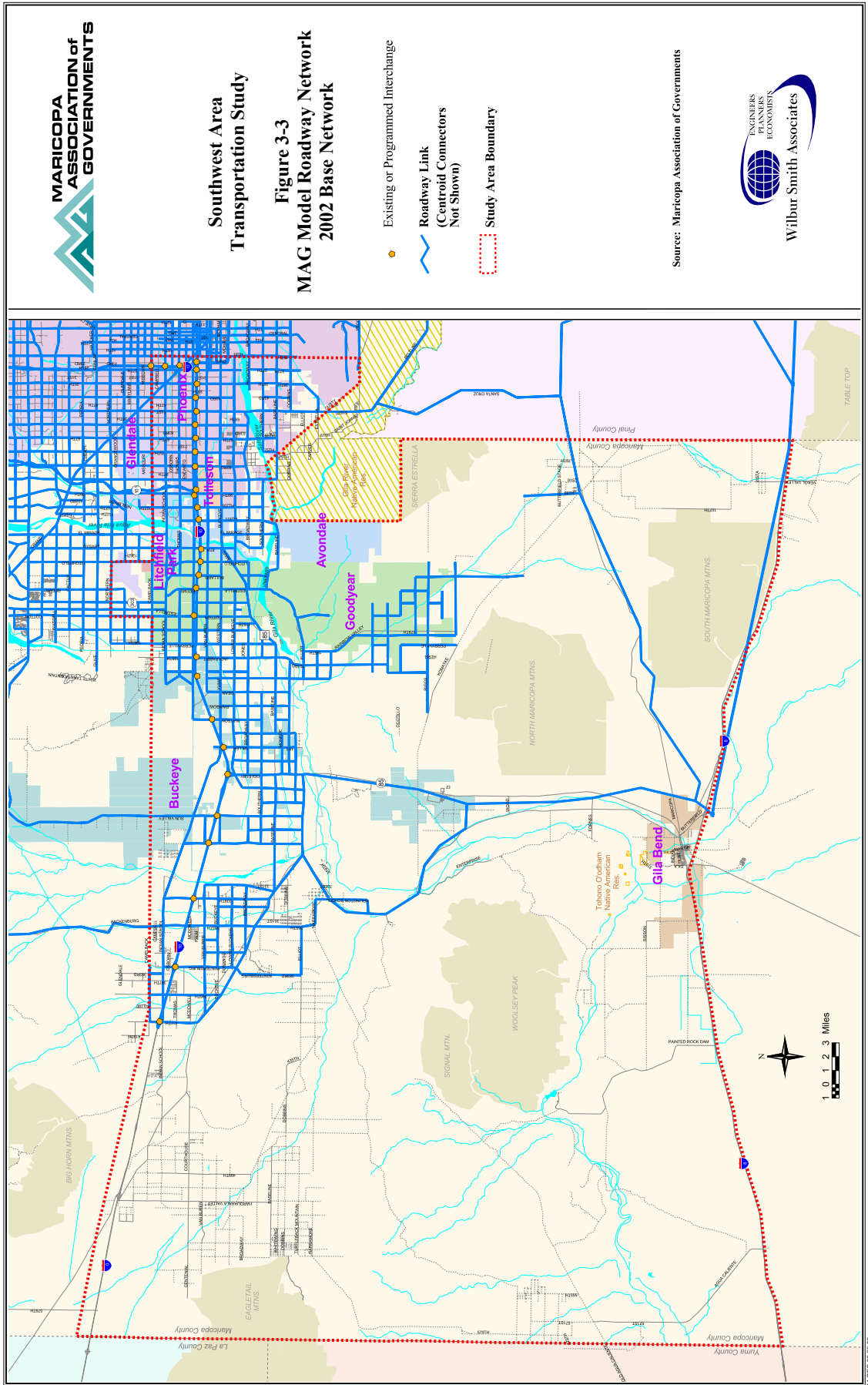
The only other east-west freeway segment, I-8, is located at the study area's southerly limit. I-8 serves as a major regional link connecting travel from the study area west to the southern California region and east toward Tucson. Few interchanges exist along this corridor due to the desert topography and the Barry M. Goldwater Guntery Range located just to the south. Travel between the west Phoenix area and I-8 is served via State Route 85.

The I-17 and State Route Loop 101 freeways also traverse the study area, but for only short distances in the north-south direction. I-17 is located near the easterly limit of the study area serving as the main north-south artery for central Phoenix and areas north of the downtown area. Loop 101, approximately 9 miles to the west of I-17, currently terminates at I-10. Extending to the north, Loop 101 serves as a westerly by-pass to I-17, providing access to the northwestern suburbs of Phoenix. Interchanges are located at one mile intervals on both facilities.

There are two expressway facilities within the study area. These facilities do not display the typical expressway characteristics which include divided roadways, four or more lanes, and a high degree of access control. Loop 303 is a two lane north-south facility, located approximately 9 miles west of Loop 101. Loop 303 originates at the I-10/Cotton Lane interchange and extends north beyond the study boundary limits to US 60/Grand Avenue. This facility serves the northern portion of the Town of Goodyear, Luke Air Force Base, and towns north of the study area. Right-of-way has been secured for future expansion of the facility. South of I-10, alternatives are being studied to extend Loop 303 south to Maricopa County Route 85 (MC-85). No time frame has been established for this work to begin.

MC-85 is the other defined expressway facility in the study area. Beginning at State Route 85 (SR-85) approximately 3 miles south of I-10, it travels approximately 17 miles east before merging into the arterial network at the Agua Fria River crossing, east of the Phoenix-Goodyear Municipal Airport. This facility currently provides motorists an alternative east-west corridor south of I-10 to the western Phoenix area, downtown, and I-17.

The general layout of the arterial and collector roadway systems in the study area is largely consistent with the grid pattern existing throughout most of the metropolitan Phoenix region orientated in the cardinal directions. These roadways are designed to connect traffic to the major regional roadway facilities from local streets and from abutting properties. East of the Agua Fria and Gila Rivers the grid system is mostly complete, with some exceptions at the river crossings, thereby providing a full complement of both north-south and east-west movements. To the west of these rivers where geography permits, implementation of the grid pattern is under development, as communities rely on land developers to complete the network. As it is the only high capacity facility in the area, most roads are currently designed to funnel traffic toward I-10.



Some isolated communities including the Estrella Mountain Ranch Development and other proposed developments have adopted curvilinear neighborhood street systems, somewhat inconsistent with the grid system. They are mostly self contained and have been planned with a street hierarchy acceptable to local officials and tying into the regional grid network.

Important arterials within the study area include SR-85 and Estrella Parkway. SR-85 serves as the main north-south corridor between I-8 at Gila Bend connecting to I-10 at milepost 112. This roadway segment primarily consists of a two lane cross section and paved shoulders with intermittent passing lanes in either direction. Estrella Parkway has four lanes serving the southern Goodyear communities south and west of Estrella Mountain before crossing the Gila River and narrowing to two lanes with bike lanes south of I-10. This road is projected to carry heavy traffic volumes for the large master planned communities in the area. Grand Avenue (US Route 60) is a major arterial slicing through the northeast section of the study area for approximately 4 miles at a 45 degree angle to the grid system, paralleling the BNSF Railroad right-of-way. This alignment creates a number of six legged at-grade intersections. Future plans include constructing grade separated intersections at Thomas Road/27th Avenue and at Camelback Road/43rd Avenue to reduce congestion.

MAG has identified a number of roadways within the study area as important to the mobility of the area. Approved in 1999, Roads of Regional Significance (RRS) typically constitute higher roadway design criteria expected to facilitate movement within the urbanized areas, supplementing the freeway system. Roads of Regional Significance identified within the study area include:

- Jackrabbit Trail – between Olive Avenue and MC85;
- Cotton Lane and Loop 303 – from north of the study area boundary south to I-10;
- Dysart Road – from MC-85 north to the study area boundary;
- 99th Avenue – between I-10 and Baseline Road;
- 59th Avenue – north of I-10 to the study area boundary;
- 19th Avenue – from Baseline Road north to the study area boundary;
- Sun Valley Parkway – from I-10 north to the study area boundary;
- Indian School Road – from Jackrabbit Trail (195th Avenue) east to the study area boundary; and
- MC-85 – between SR-85 and I-17.

A six lane divided cross-section with bike lanes, a 140-foot right-of-way, and limited access is the typical design. Implementation of this system has been limited to date.

A similar system, called Arterial Roadway Corridors (ARCs) has also been defined for this study. These routes have been identified potentially for substantial improvements designed to handle higher volumes at somewhat higher speeds than typical arterial roadways. Potential ARC routes in the study area include:

- McDowell Road east of Sun Valley Parkway beyond the eastern study area boundary;
- Yuma Road east of SR-85, following Buckeye Road east beyond the study area boundary;
- Beloit Road east of SR-85 to Jackrabbit Trail;
- Maricopa-85 east of Jackrabbit Trail to Estrella Parkway;
- 59th Avenue north of I-10 beyond the study area boundary;

- Dysart Road north of Broadway beyond the study area boundary;
- Estrella Parkway south of I-10 to Elliot Road, continuing on Elliott Road to Rainbow Valley Road;
- Perryville Road from north of the study area to I-10 and to the south on either Perryville Road or Jackrabbit Trail connecting to Rainbow Valley Road to the south; and
- Miller Road from I-10 south to Beloit Road.

Some portions of the arterial roadways on the ARC system do not currently exist, while others are not yet constructed to the design standard envisioned for ARC roadways.

Figure 3-4 displays the future LRTP based roadway network projected to be completed and used for all future year traffic forecasts. Additions and changes from the existing roadway network reflect programmed and planned improvements, including some changes identified by local jurisdictions.

Figure 3-5 highlights new roadways included in the future LRTP based network. One new high capacity, high speed roadway is shown in the study area. Work on the Santan Freeway, east of the study area, is currently advancing with a scheduled completion date of 2007. The western extension of this freeway, the South Mountain Bypass (Loop 202), will serve the study area. Although funding has not been established, implementation of this facility will provide a southerly by-pass of downtown Phoenix. Final alignment is currently under investigation.

Other new roadways in the future LRTP based network include the addition of arterial and collector roads north of I-10 on either side of the White Tank Mountains. New roadway segments along Grand Avenue reflect the planned replacement of some signalized at-grade intersections with overpasses. Construction of 195th Avenue north of Indian School Road and connections to the east are included. Other localized improvements are shown in the figure. Figure 3-5 also displays extensions of the region's HOV lanes on I-10, I-17, and Loop 101 in the future LRTP based network.

Additional characteristics of the roadways in the study area are noteworthy. These include the extensive river crossings, scalloped street curb lines, and the variety of area types found within the study area. Four rivers, the Salt, the Agua Fria, the Hassayampa, and the Gila, flow through the more populated northerly section of the study area. Rivers are a natural impediment to travel.

Overcoming this impediment opens up new lands for development, but represents a substantial investment in the bridges needed to accomplish the task.

The Salt River (also known as Rio Salado) enters the study area in the northeast corner, meanders in a southwesterly direction for approximately 10 miles south of the I-10 corridor, and flows into the Gila River at approximately 107th Avenue. The Agua Fria River, traveling in a southerly direction, enters the study area at Camelback Road and 115th Avenue before combining with the Gila River in southwest Avondale near the intersections of Litchfield Road and Indian Springs Roads. The Gila River, entering the study area from the Gila River Indian Community flows in a northwesterly direction until it is joined by the Salt River. The Gila then travels in a westerly direction and is joined by the Agua Fria River. The Gila continues west past SR-85 and is joined by the Hassayampa River before turning south toward Gila Bend.

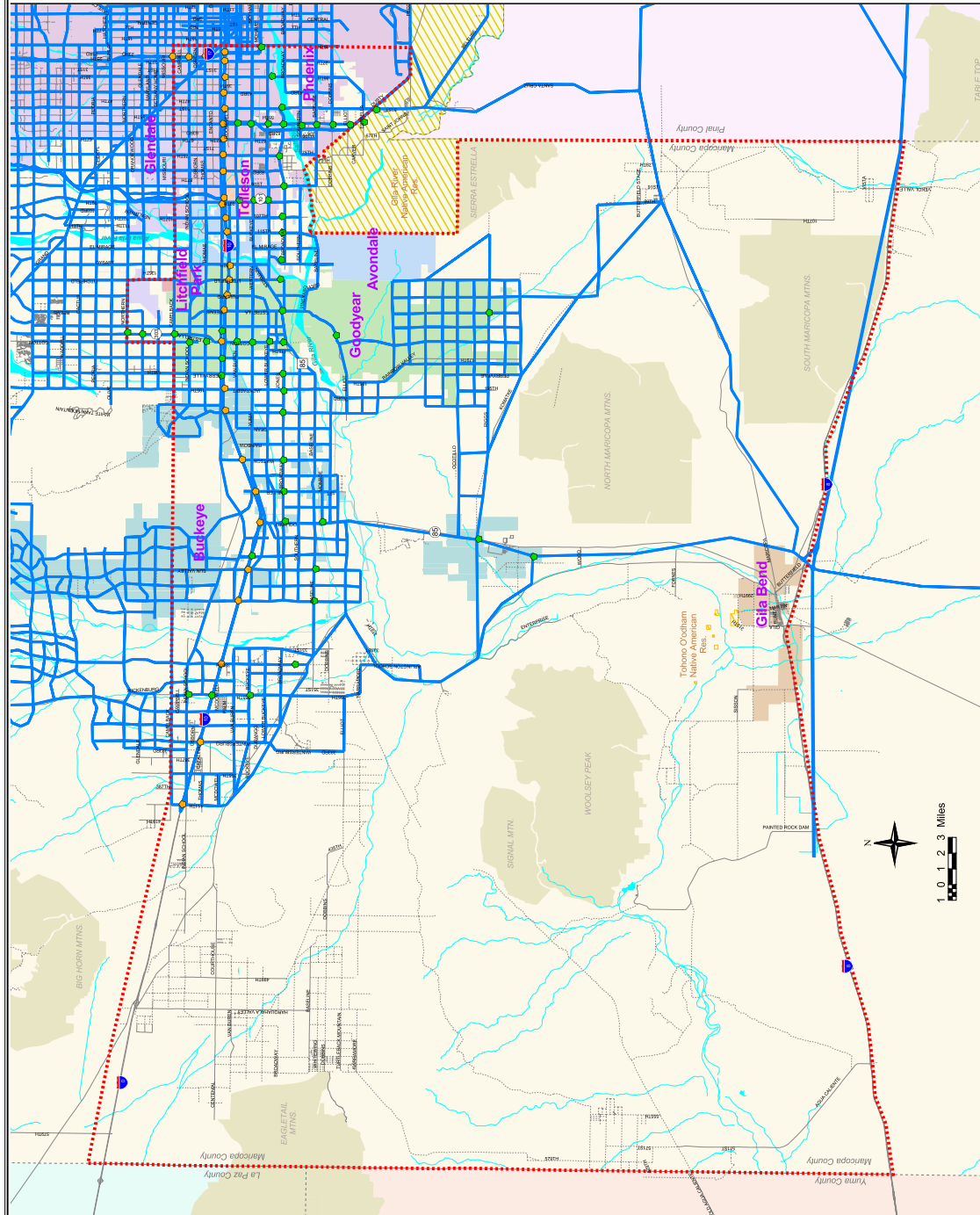
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Figure 3-4

**MAG Model Roadway Network
LRTP Based Reference Network**

- Existing or Programmed Interchange
- Future Interchange
- Roadway Link
(Centroid Connectors
Not Shown)
- Study Area Boundary

Source: Maricopa Association of Governments

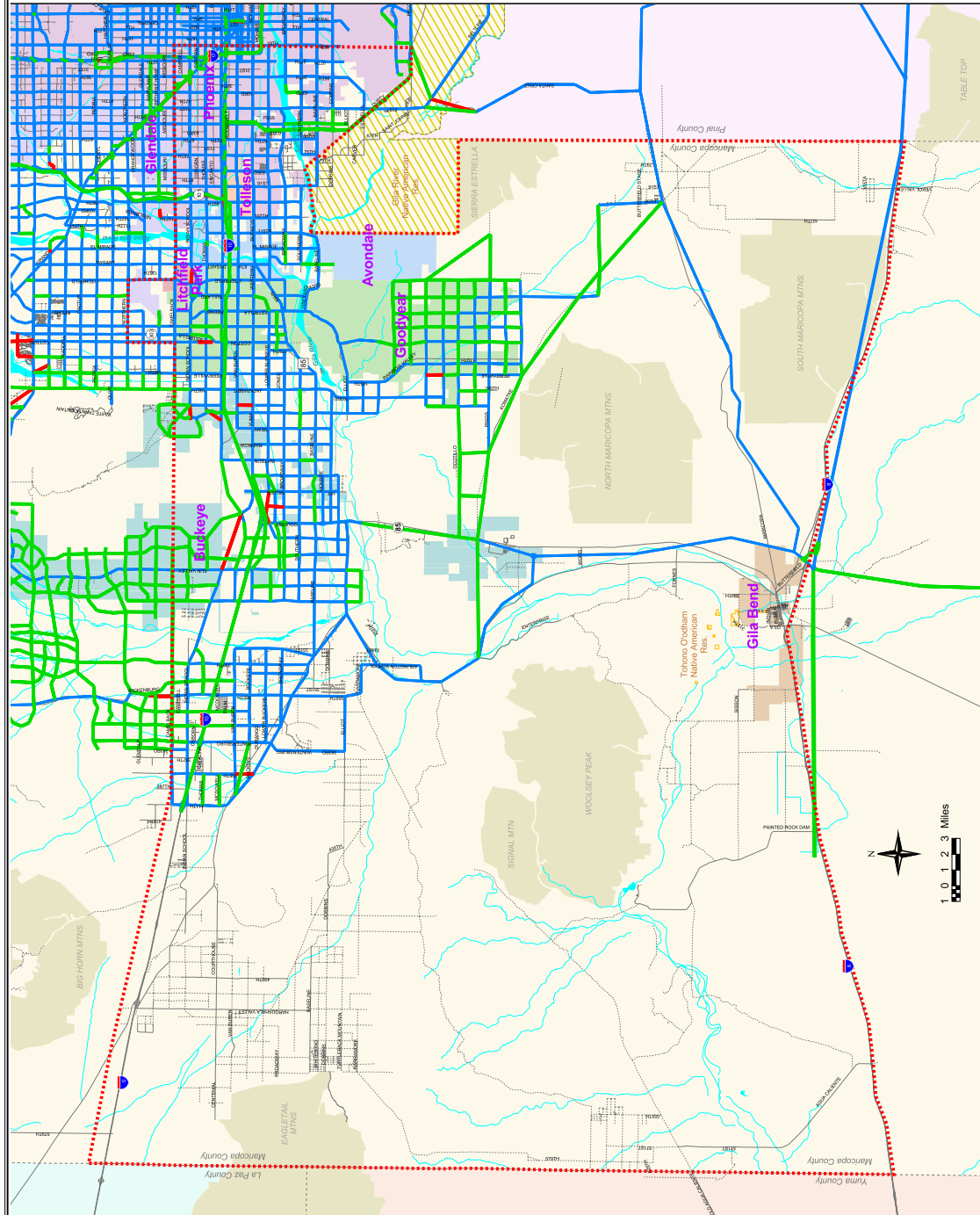


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**Figure 3-5
MAG Model Roadway Links
Additions and Deletions from 2002
Base Network to LRTP Based
Reference Network**

- Future Base Roadway Link
- Added Link
- Deleted Link
- - - Study Area Boundary

Source: Maricopa Association of Governments



River crossings in the more developed northeastern portion of the study area are identified below. Salt River roadway crossings, from east to west include:

- 19th Avenue;
- 35th Avenue;
- 51st Avenue;
- 67th Avenue; and
- 91st Avenue.

Agua Fria River crossings, from north to south include:

- Camelback Road;
- Indian School Road;
- McDowell Road;
- I-10;
- Van Buren Street;
- Buckeye Road; and
- Lower Buckeye Road.

Gila River crossings, from east to west include:

- 115th Avenue;
- 123rd Avenue (El Mirage Road);
- Bullard Avenue (147th Avenue);
- Estrella Parkway;
- Tuthill Road/Jackrabbit Trail;
- Airport Road; and
- SR-85.

Another characteristic of roadways in developing parts of the Phoenix metropolitan area, including the study area, is the widening of sections of arterial roadways in a piecemeal fashion, resulting in “scalped” curb lines. This happens when development occurs along a rural two lane arterial roadway, typically with 66 feet of right-of-way. As a parcel develops, the responsible public agency typically requires the developer to dedicate additional right-of-way and widen the roadway on the side being developed. This additional dedicated right-of-way is typically enough to provide half of a 120 to 140-foot ultimate right-of-way. The developer’s construction of abutting roadway results in some sections which are widened to two or three lanes in one direction on a half-section of 60 to 70 foot right-of-way, while the opposite side or adjacent section may remain only one lane on a 33-foot half section of right-of-way. The resulting irregular curb line is a condition commonly referred to as “scalped street” or “scalped curb line”. The capacity of the roadway is limited by the section with the least capacity and the shifting pavement edge can be hazardous for bicyclists moving laterally in and out of travel lanes.

A third noteworthy roadway characteristic involves the differences between roads in the lightly developed portions of the study area and the more intensely developed urban areas. As one travels east and north through the study area, land use, development intensity, travel patterns, and roadway

characteristics change. Curb and gutter increasingly capture roadway runoff, intersection control changes from stop control to signal control, and an increase in the number of lanes is required to serve additional traffic demand. As population and employment centers become more intense, the movements of a greater number of people occur in less space. Vehicle occupancy increases and higher levels of public transit are available. An increase of pedestrian trips is observed and there are more conflicts between vehicles and pedestrians for street space. Extended pedestrian crossing times at traffic signals reduce vehicle capacity. Although these changes generally occur as one moves toward the northeast corner of the study area, there are pockets of older development throughout the study area that exhibit some of these more intense transportation characteristics, such as Tolleson and Avondale.

The study area's roadway network is extensive. The following sections provide additional details on particular aspects of the current and future LRTP based roadway networks.

3.1.1.2 Functional Classification

Roadways are classified according to function served in the circulation system. On the lower end of the functional classification system are local streets whose principal function is to provide access to abutting property. At the higher end of the system are freeways whose principal function is to move traffic longer distances at higher rates of speed. Each class fits into a hierarchy of vehicular speed and lane capacity based on design characteristics.

MAG uses ten "facility types" that, in part, represent the functional classes of roadways included in the network component of the MAG travel demand model. MAG's facility types include freeways, hov lanes, expressways, arterials (of two types as described below), and collectors. These facility types are used to describe the functional class of roadways in the study area. Each of these classes is defined below consistent with generally accepted definitions found in the transportation literature. Local streets are not included in the MAG model network, but these are mostly low speed, two lane roads providing property access. Four of MAG's facility types (centroid connectors, freeway ramps, ramp meters, and river crossings) are not used to describe the functional class of roadways.

- Freeway – A high speed, high capacity roadway with full access control. The main purpose of these facilities is to serve the movement of goods and people over longer distances both between regions and over longer distances within regions. This roadway type serves travel to and from destinations of longer trip length.
- High Occupancy Lanes (HOV) – Exclusive lanes currently found on freeways designated for buses, motorcycles, and passenger vehicles with occupancy of two passengers or more during peak travel demand periods. During off peak periods, the HOV lanes function as general purpose lanes without occupancy restriction. Exclusive HOV ramp systems are present on some freeway to freeway connections to increase safety and facilitate movement. These lanes provide less congested traffic service to vehicles serving more than a single passenger.
- Expressway – A high speed, high capacity roadway with partial access control. Expressways may contain at-grade intersections and median separation between travel directions. This facility type serves longer distance travel mostly within a region. Some expressways include a bike lane.
- Arterial – A medium capacity, mid-speed roadway connecting freeways or expressways to other less significant road classifications. These roads serve medium length trips, may have partial access control, and usually include at-grade signalized intersections. The arterial

system in the SWATS area is generally a grid at 1 mile intervals within more developed areas of the region. Arterials typically have a minimum four, and typical six, lane cross section. Many arterials include bike lanes. MAG's model separately classifies arterials into major arterials and arterials with a six-legged intersection.

- Collector – A lower volume, lower speed roadway as compared to arterials designed to distribute traffic to other lower class roads, and to provide access to employment centers and abutting properties. These roadways can be located at the mile or half-mile section within developed areas or serve as the major roadway connection in more rural areas.

Figure 3-6 shows the functional classification of the existing roadway network. The data are taken from the MAG travel model network. The area covered by MAG's model does not include the entire study area, particularly the less developed areas to the south and west. (Data on roadway mileage by functional class are presented in the following sections.) This figure shows a concentration of roadways in the northeasterly portion of the study area north of the Salt and Gila Rivers and east of Cotton Lane. In this area there is a fairly complete arterial grid network and a full complement of all roadway classification types. Developing areas south and west of this quadrant, including the areas of Avondale, Goodyear, and Buckeye, provide arterial and collector roadways focused on directing traffic toward I-10 then east toward the Phoenix area. Isolated rural development south and west of the I-10 corridor contains mostly lower classification roadways. Only one major road, State Route 85 connects the northern and southern portions of the study area. In the rural desert areas of the southern portion of the study area, there are only two roads of higher functional class: Maricopa Road (SR-238) and I-8. The area west of SR-85 contains farmland and desert space, with a scattering of two lane roads, both paved and unpaved.

Figure 3-7 illustrates the functional class of roadways in MAG's future LRTP based roadway network. In some instances, the roadway classification has changed between the current and the future LRTP based networks. These changes can be attributed to improvements currently programmed into agency budgets or to other anticipated improvements that have a high probability of being implemented by developers and governmental agencies. Review of Figure 3-7 reveals that most new road development is limited to the northeast portion of the study area. New roadway segments are also identified north of I-10 near Buckeye and in south Goodyear as a result of planned developments in the area. Continued upgrading of the arterial grid network from the existing condition is projected. The southern portion of the study area is not currently planned for major development and is likely to remain largely without major new road construction.

To better identify the changes in functional class between the current and future LRTP based networks, Figure 3-8 identifies roadway segments that have been upgraded in functional classification (higher speed and capacity) or are new, as well as roadways that have been downgraded in functional class.

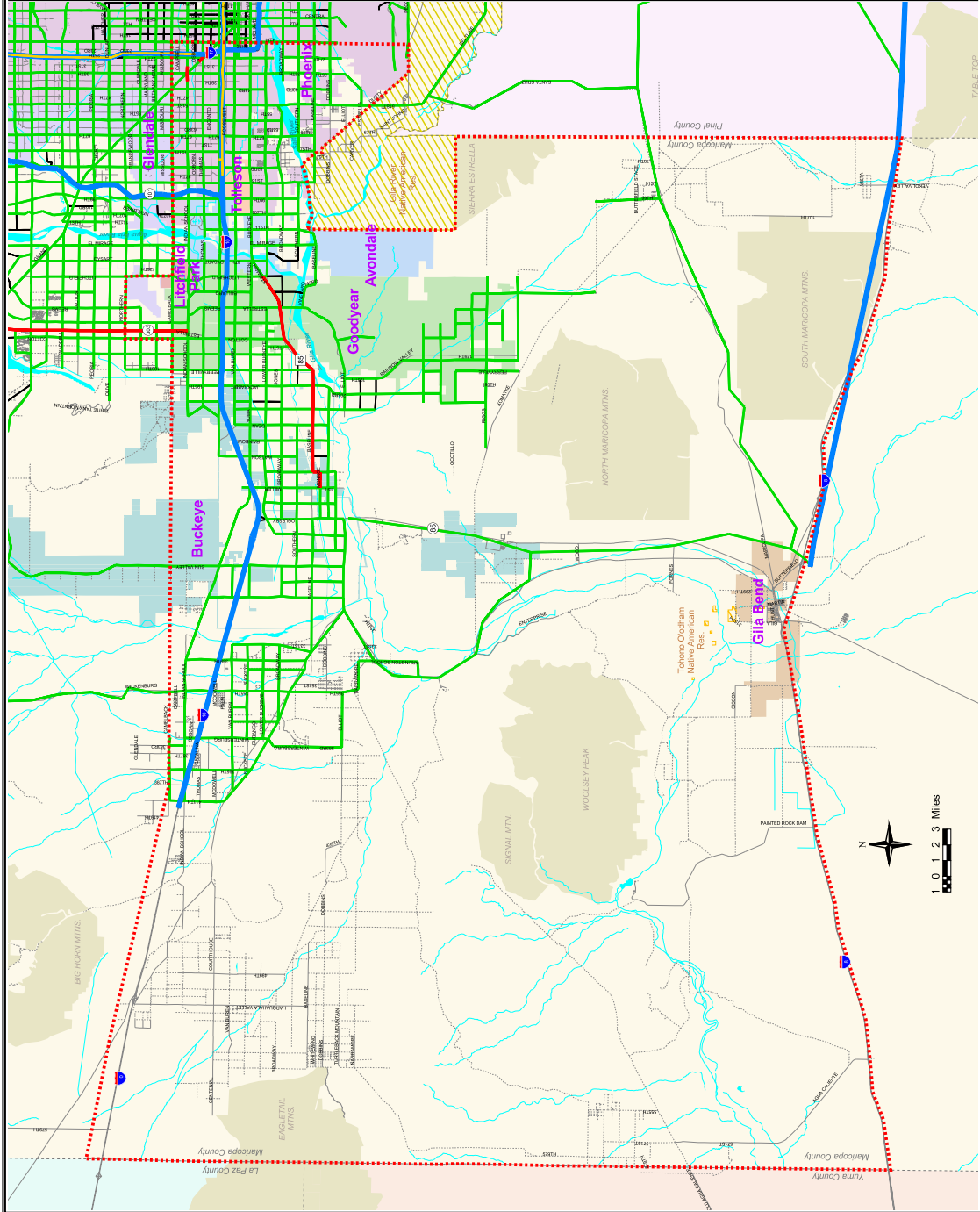
Below are the major upgrades in functional class between the current and future LRTP based roadway networks:

- South Mountain Bypass from I-10 in the east to I-10 connection at 55th Avenue (new);
- I-10 HOV Lanes from Loop 101 to 411th Avenue (new);
- Loop 101 HOV Lanes from I-10 north (new);
- SR-85 from I-10 to Kumatke Road (upgrade from arterial to freeway);
- SR-85 from Maricopa Road to I-8 (arterial to freeway);

Figure 3-6
Functional Class of Roadways
2002 Base Network

- HOV Lane
- Freeway
- Expressway
- Arterial
- Collector
- Study Area Boundary

Source: Maricopa Association of Governments

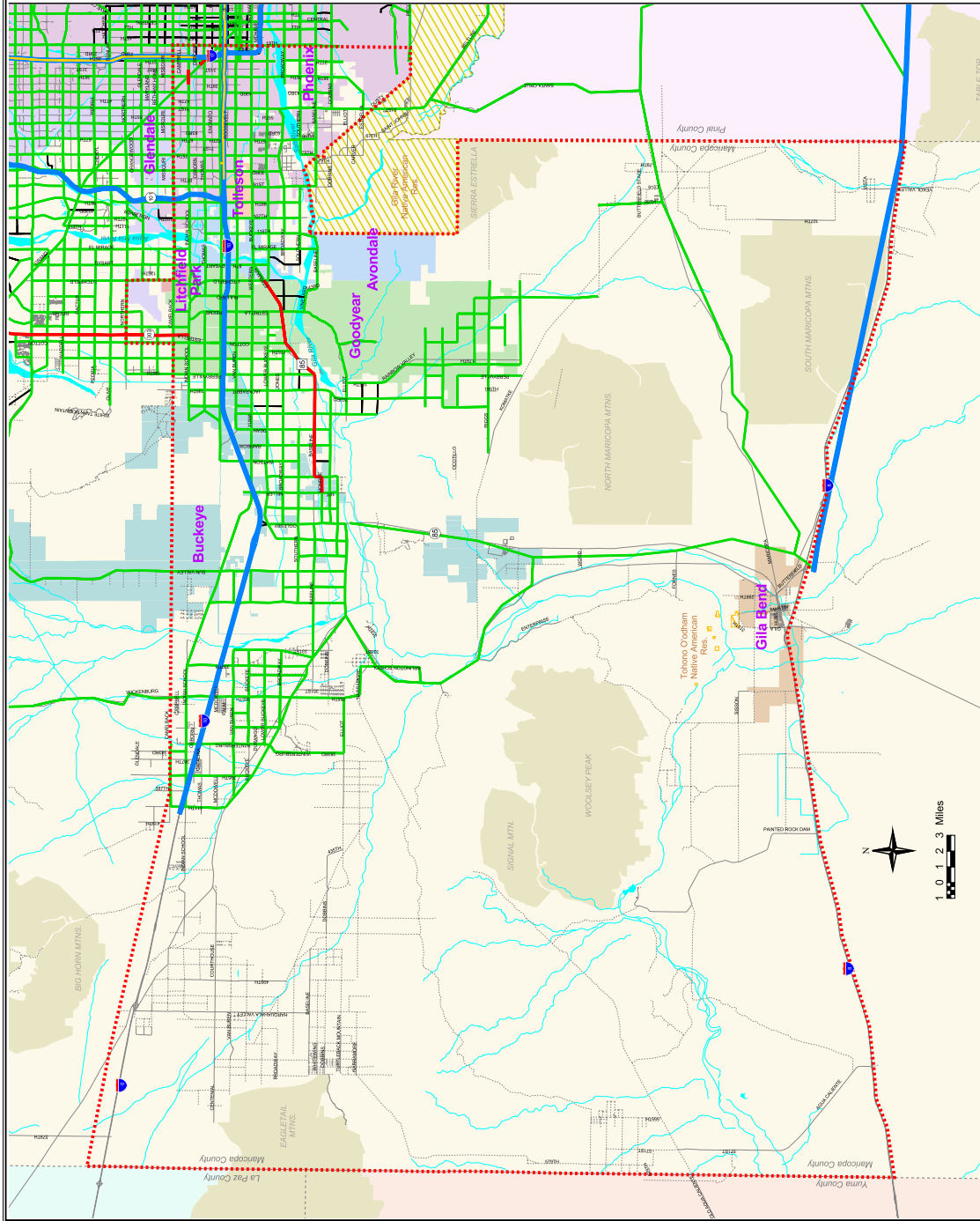


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**Figure 3-7
Functional Class of Roadways
LRTP Based Reference Network**

- HOV Lane
- Freeway
- Expressway
- Arterial
- Collector
- Study Area Boundary

Source: Maricopa Association of Governments

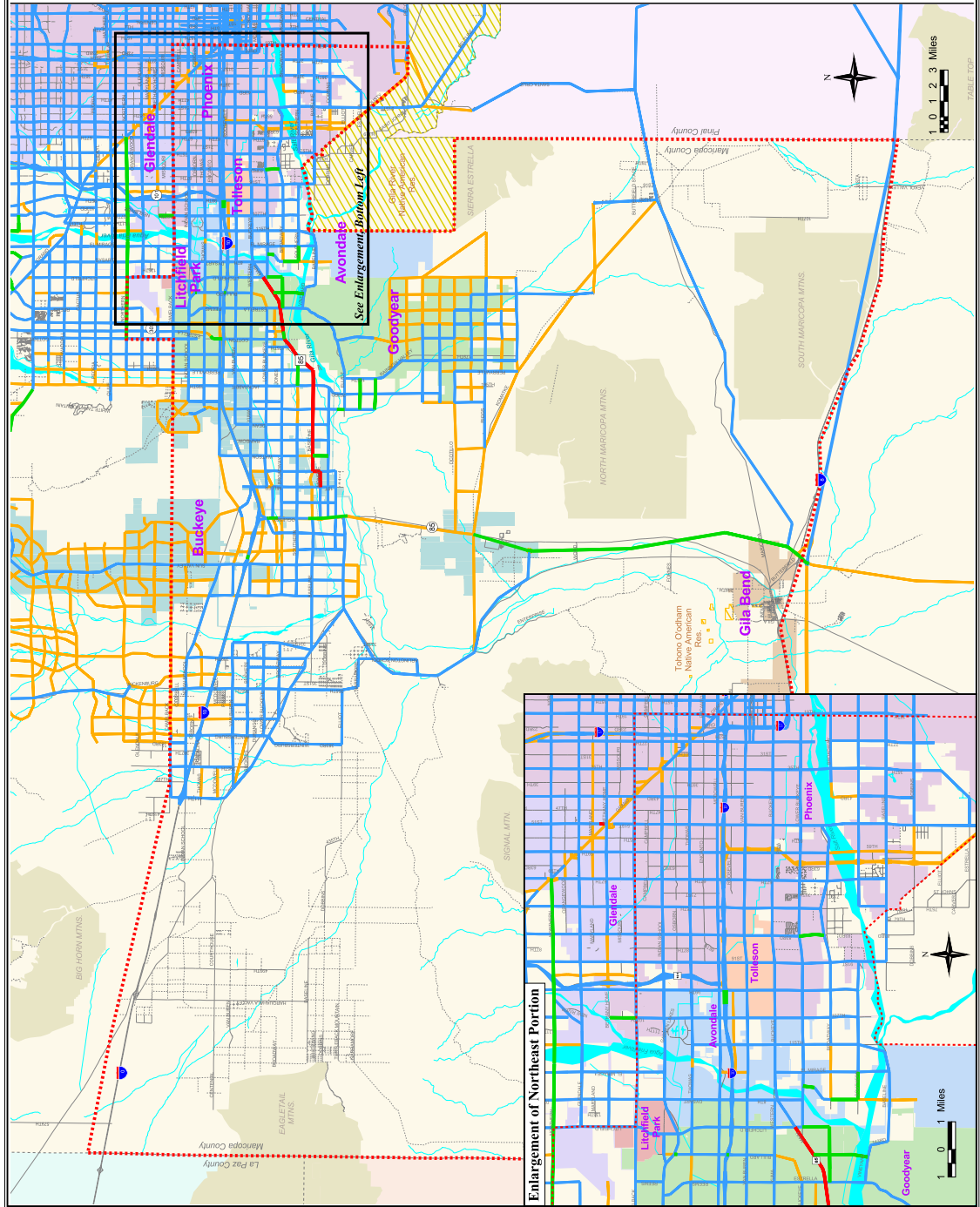


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Figure 3-8
Functional Class of Roadways
Upgrades and Downgrades from
2002 Base Network to LRTP Based
Reference Network

- Upgraded Link
- Downgraded Link
- Unchanged Link
- Link Not Present in 2002 Network
- Study Area Boundary

Source: Maricopa Association of Governments



- Upgrades of several collector roads to arterial status in Goodyear;
- Grand Avenue (US 60) from 6 legged arterial to arterial with some expressway segments;
- Continuation of the grid system north of I-10 in the Buckeye area;
- I-10 / I-17 ramp to ramp HOV lanes; and
- Numerous new freeway ramp metering locations.

Figure 3-8 and the above list provide a representation of projected roadway construction. Only one newly planned expressway or freeway facility is projected, the South Mountain Bypass. This facility is included in the future LRTP based network as a loop to the southwest of central Phoenix, connecting I-10 at 55th Avenue to the Santan Freeway in Chandler, running adjacent to the northern section of the Gila River Indian Community. Alternative alignments are currently being studied and a preferred alternative will not be available within the timeframe of this study. This roadway is projected to help relieve congestion in the South Mountain Park and south Phoenix areas. Only one roadway is projected to be upgraded from its current arterial classification to freeway status, SR-85. Approximately 13.5 miles of SR-85 is projected to be constructed as freeway between I-10 and Komatke Road and approximately 3 miles north of I-8 in Gila Bend. This leaves 17 miles of SR-85 as arterial. The expansion and filling of the existing arterial grid network is also anticipated. The only additional river crossings projected in MAG's future LRTP based roadway network in addition to the South Mountain Bypass crossing of the Salt River is a parallel crossing on 59th Avenue and a Gila River crossing at Cotton Lane.

3.1.1.3 Number of Lanes

The current and future number of through travel lanes in each direction have been extracted from MAG's traffic model for both the current and future LRTP based networks. Figure 3-9 shows the number of travel lanes in each mid-block section of the current roadway system. Roadways in the study area but outside the area modeled in the MAG network are not shown in the figure. Generally, such roadways have a single lane in each direction, except for the highest functional classes such as freeways. The lowest functional class roadways, local streets, are not shown in the figure since they are rarely included in the MAG network. Most of those roadways have a single lane in each direction. Auxiliary or turn lanes at intersections and other locations are not shown in the figure. The figure does not reflect mid-block changes in lanes created by spot development of abutting land or by other causes of irregular pavement width. Figure 3-10 shows the travel lanes assumed in MAG's future LRTP based network.

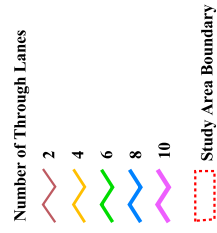
Review of the existing lane configuration indicates the number of travel lanes in the study area varies within each of the functional classes, with a higher concentration of multi-lane facilities in the more populated areas.

The major east-west freeway in the study area, I-10, varies in the number of lanes, decreasing in number as the distance from central Phoenix increases. Four general purpose through lanes are carried in each direction at the eastern boundary of the study area (at 19th Avenue) to the interchange with Loop 101, where the number of lanes falls to three. The three lanes are carried through the cities of Tolleson and Avondale and are reduced to two lanes west of the Agua Fria River crossing. I-10 then remains two lanes in each direction as it continues westward through the study area.

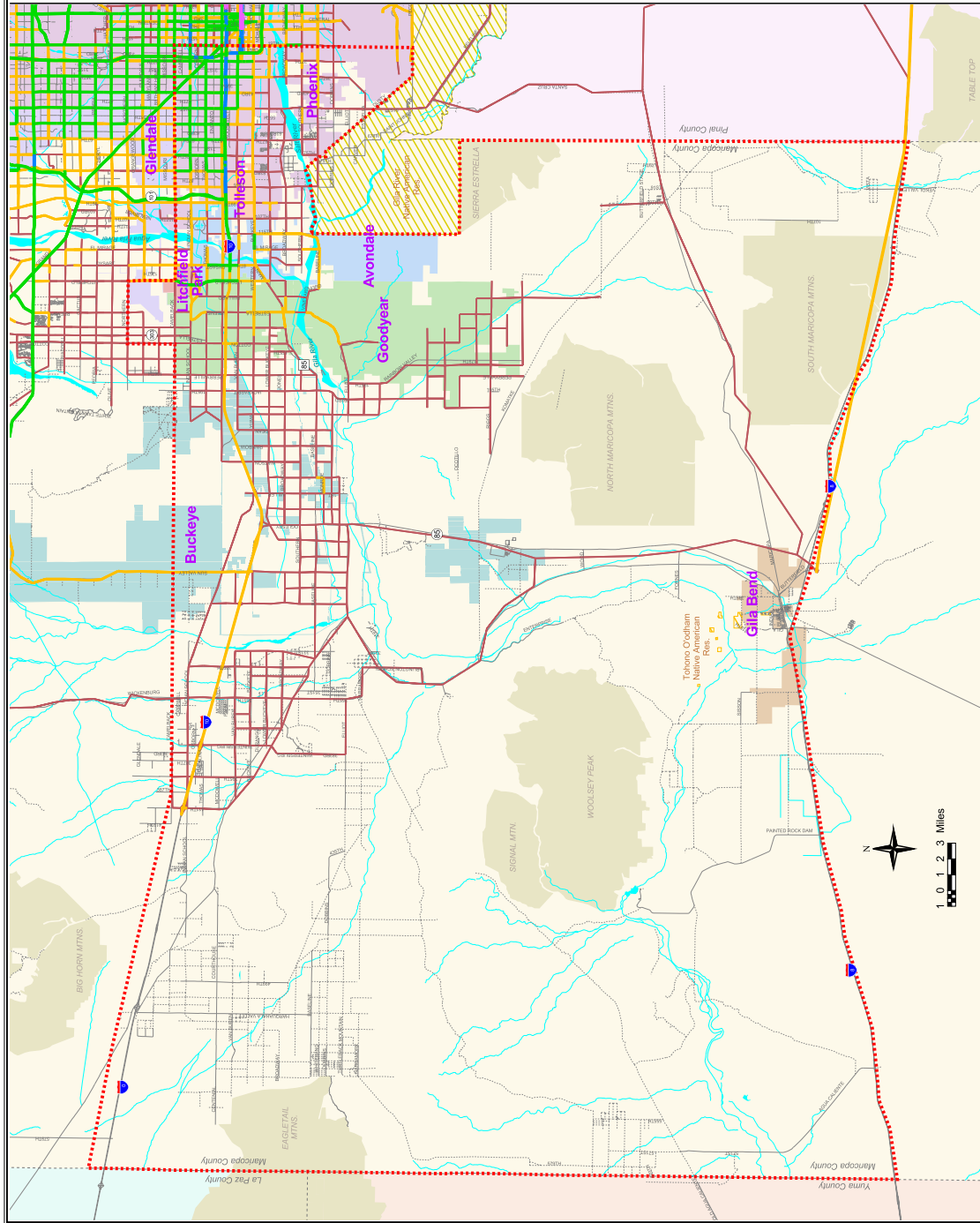
HOV lanes in the study area are confined to I-10 and I-17 freeway sections. On I-17 HOV lanes are provided north of Thomas Road. On I-10 HOV lanes are provided west of central Phoenix to Loop

**Southwest Area
Transportation Study**

**Figure 3-9
Number of Roadway Lanes
2002 Base Network**

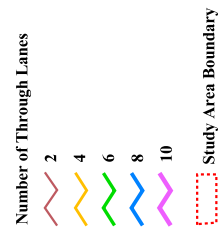


Source: Maricopa Association of Governments

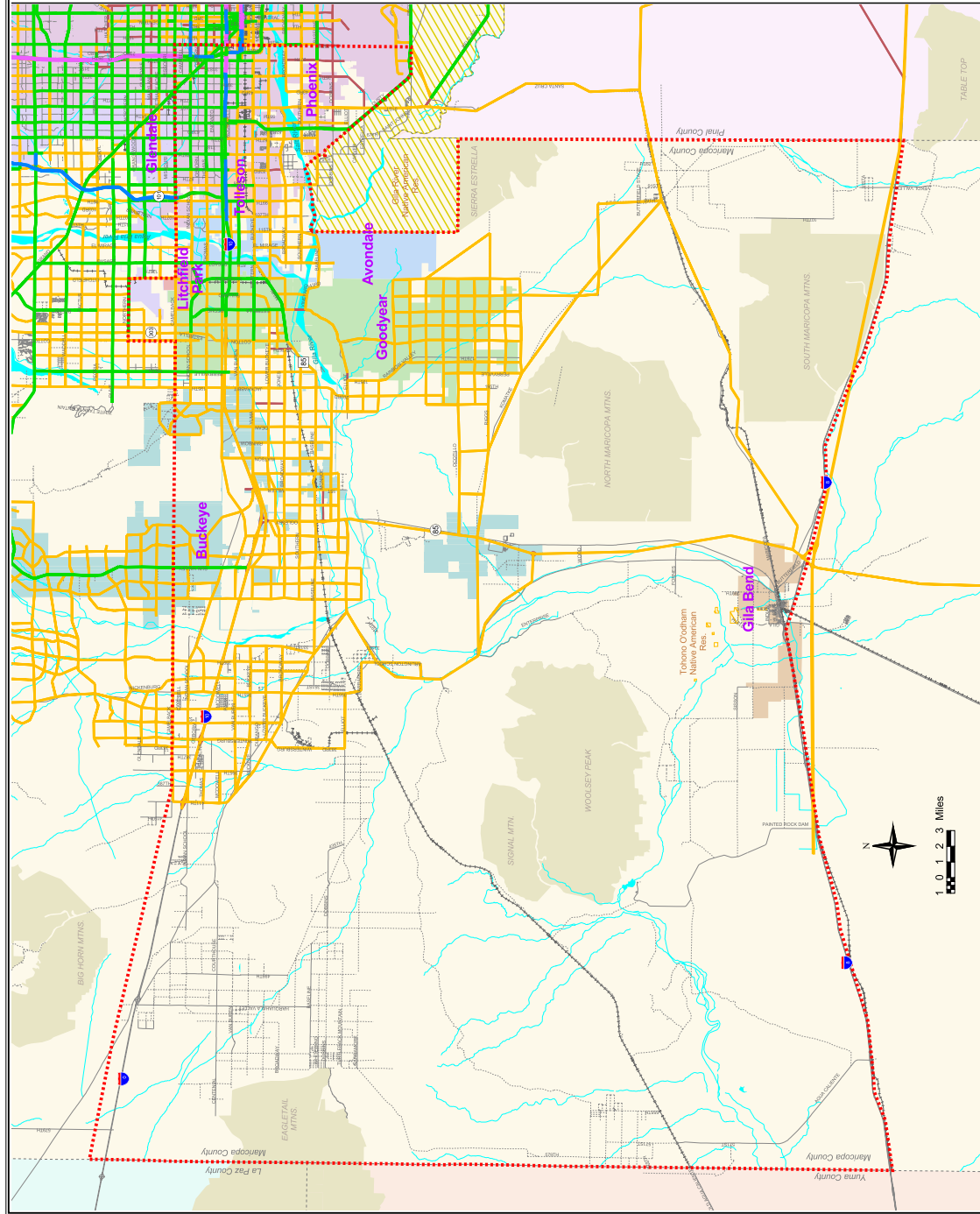


**Southwest Area
Transportation Study**

**Figure 3-10
Number of Roadway Lanes
LRTP Based Reference Network**



Source: Maricopa Association of Governments



101. One HOV travel lane is provided in each direction. Lane widths for this roadway type follow typical design standards and are a minimum 12 feet in width. They are located on the inside of the highway beside the median or center divider.

Designated expressways in the existing condition are mostly two lane roadways, with some four lane segments. MC-85 has variable pavement width with an irregular cross section west of its crossing over the Agua Fria River, from which it maintains four lanes to the east. Loop 303 is a two lane facility currently being upgraded to a four lane divided facility from Indian School to McDowell Road.

Arterial and collector road widths vary with adjacent development and population as to their number of lanes. In the extreme northeast section of the study area, each arterial provides 6 lanes. South of I-10 and west of the Loop 101, the arterial grid reduces to a 2 or 4 lane cross section. West of the Town of Goodyear, the majority of roads provide for only a single travel lane in each direction.

Review of MAG's future LRTP based roadway network reveals that significant construction is projected to add lanes to existing roadways. In the more populated northeast, many arterial level roads will provide for an additional travel lane in both directions. Many roads in the less populated areas west of SR-85 show an increase in lanes. Figure 3-11 displays roadway segments projected to be widened or narrowed in MAG's future LRTP based network.

3.1.1.4 Centerline and Lane Miles

Table 3-1 shows the centerline miles of the current roadway by functional class by area type in the study area based on MAG's traffic model. Because the MAG model does not cover 100 percent of the study area and the model network is the source for these data, mileages by functional class and area type in rural areas are understated. Mileages of unclassified streets represent the difference between total roadway centerline miles in the MAG roadway database and the sum of all classes as shown in Table 3-1. The table shows that there are currently over 4,000 centerline miles of streets and highways in the study area, and that 1,000 of those miles (or 25%) are of a functional class higher than local streets.

Table 3-1
Current 2002 Base Network Centerline Roadway Miles
by Functional Class by Area Type

Facility/Area Type	CBD	Urban	Urban Fringe	Suburban	Rural	Total
Freeway with HOV	0.7	4.8	2.8	1.8	0.0	10.1
Freeway no HOV	3.8	1.3	1.1	10.2	62.9	79.3
Expressway	1.1	0.9	0.0	0.0	19.0	21.0
Arterial	4.4	41.2	35.9	145.8	634.6	861.8
Collector	2.0	4.1	1.9	4.7	13.8	26.5
Total Classified	12.0	52.4	41.6	162.4	730.3	998.8
Unclassified						3,023.3
Total						4,022.1

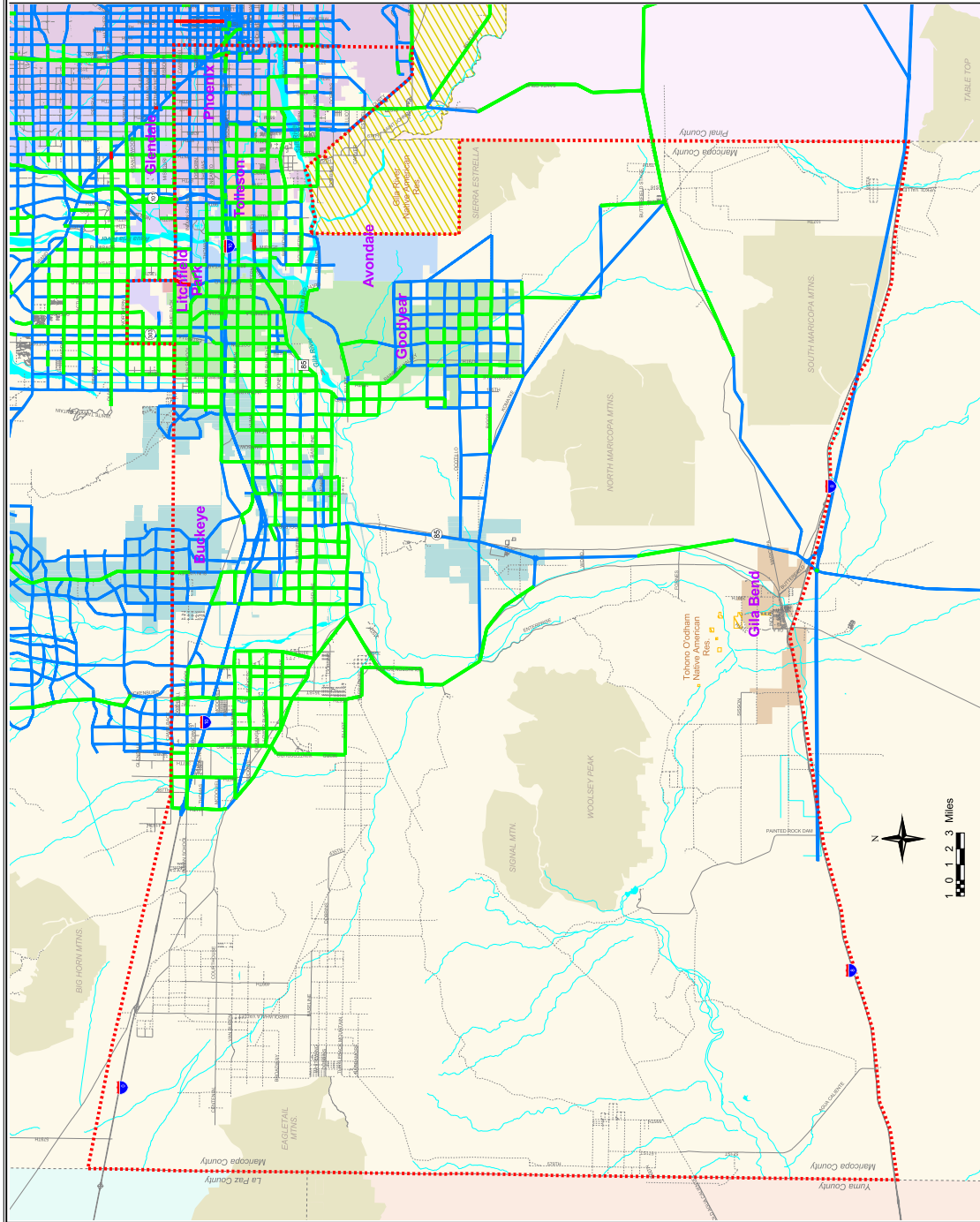
Source: MAG

**Southwest Area
Transportation Study**

**Figure 3-11
Number of Roadway Lanes
Widenings from 2002 Base Network
to L RTP Based Reference Network**

- Future Base Roadway Link
- Widened Link
- Narrowed Link
- Study Area Boundary

Source: Maricopa Association of Governments



Area type reflects five different kinds of development ranging from the central business district (CBD) to rural. Table 3-2 shows centerline miles from MAG's future LRTP based network. That table shows 291.6 more centerline miles of the covered classes than are shown in the current network (as depicted in Table 3-1). The substantial changes in centerline miles by area type indicate extensive modification to the boundaries of the area types.

Table 3-2
LRTP Based Reference Network Centerline Roadway Miles
by Functional Class by Area Type

Facility/Area Type	CBD	Urban	Urban Fringe	Suburban	Rural	Total
Freeway with HOV	2.8	11.9	17.4	24.0	5.1	61.1
Freeway no HOV	1.7	1.6	3.7	11.6	32.6	51.1
Expressway	0.0	1.9	1.0	8.0	24.5	35.4
Arterial	9.2	81.5	170.6	507.7	355.8	1,124.8
Collector	4.1	7.1	5.0	1.9	0.0	18.1
Total Classified	17.6	104.0	197.6	553.1	418.0	1290.4

Source: MAG

Multiplication of each roadway segment's length by its number of lanes provides total roadway lane miles within the study area. Table 3-3 shows the existing number of lane miles by functional class by area type based on the roadway network in MAG's traffic model. About 2,750 lane miles provide traffic service in the study area. This is exclusive of local streets and other minor facilities not included in MAG's traffic model network and all roadways outside the portion of the study area covered by the MAG traffic model. In MAG's future LRTP based network shown in Table 3-4, the number of lane miles doubles to about 5,500.

Table 3-3
Current 2002 Base Network Roadway Lane Miles by Functional Class by Area Type

Facility/Area Type	CBD	Urban	Urban Fringe	Suburban	Rural	Total
HOV Lanes	1.5	9.6	5.7	3.5	0.0	20.3
Freeway (except HOV)	22.3	44.2	24.3	71.9	251.7	414.3
Expressway	6.5	3.7	0.0	0.0	43.6	53.8
Arterial	21.9	206.3	156.3	458.8	1,355.3	2,198.7
Collector	7.0	12.5	7.5	12.3	29.6	69.0
Total Classified	59.2	276.3	193.8	546.5	1,680.2	2,756.0

Source: MAG

Table 3-4
L RTP Based Reference Network Roadway Lane Miles
by Functional Class by Area Type

Facility/Area Type	CBD	Urban	Urban Fringe	Suburban	Rural	Total
HOV	5.5	23.7	34.7	48.0	10.2	122.1
Freeway (except HOV)	23.4	90.4	119.0	155.5	150.7	539.0
Expressway	0.0	10.1	5.8	37.0	98.1	151.0
Arterial	47.4	398.0	744.3	2,044.6	1,423.3	4,657.6
Collector	17.2	30.0	20.2	3.7	0.0	71.1
Total Classified	93.5	552.3	924.0	2,288.7	1,682.3	5,540.7

Source: MAG

Using a daily capacity of 21,000 vehicles per lane for freeways and expressways and a daily capacity of 8,000 for arterials and collectors, capacity miles in the study area were calculated for each functional class. Table 3-5 shows daily capacity by functional class for the current and future L RTP based networks. The table indicates that daily capacity availability for each facility type will increase between the current and future networks. The smallest capacity increase is projected for the collector facility type, an increase of only 17,000 capacity miles or 3 percent above the existing base model year.

Table 3-5
Capacity Miles by Functional Class

Facility Type	Lane Capacity (per day)	Current 2002 Base Network Capacity Miles	L RTP Based Reference Network Capacity Miles
HOV	21,000	426,090	2,564,940
Freeway	21,000	8,700,720	11,318,370
Expressway	21,000	1,129,800	3,171,420
Arterial	8,000	17,589,200	37,260,400
Collector	8,000	551,600	568,480
Total Classified		28,397,410	54,883,610

3.1.1.5 ITS Implementation

Intelligent Transportation Systems (ITS) is the application of communication technologies and management strategies, as well as advanced sensor, computer, and electronic technologies in an integrated manner. It is the goal of ITS to improve the safety and overall efficiency of the ground transportation system. ITS infrastructure in the Phoenix metropolitan area consists of field devices (such as programmable electronic message boards, cameras, on-ramp meters, vehicle sensors, and vehicle location devices) which are integrated into a regional communications network linked to centralized transportation management centers. ITS is also used for pedestrian detection to trigger signal changes, for warning signals for persons with disabilities, and for improved crossing

information, such as visible signal countdown.

The Phoenix metropolitan area started the process of implementing ITS in the early 1980s. Today the MAG region has a vast ITS network that includes Traffic Signal Coordination, ADOT's Freeway Management System (FMS), the Metropolitan Model Deployment Initiative, Statewide ITS Early Deployment Plan, and Rural ITS Deployment. The services that will be provided in the study area utilizing ITS will include:

- Better and more responsive traffic management strategies;
- Reduced delays due to traffic incidents;
- Better traffic information to motorists; and
- Facilities that help motorists plan their trips.

Existing freeways in the study area will be among the first to be added to the Regional Freeway Management System (FMS). New freeways such as Loop 303 and the I-10 Reliever, will be added to the FMS upon their completion.

All arterial traffic management systems are operated independently by the municipalities in the study area and elsewhere throughout the MAG region. A number of municipalities in the study area either have or are planning to build local Traffic Management Centers (TMSs). Efforts are already underway to integrate individual agency systems and the FMS as a regional traffic management system. The regional architecture that will serve as the basis for accomplishing this is contained in the *MAG ITS Strategic Plan*. A backbone of that plan is a system of telecommunications linking transportation facilities around the region and the southwest valley. Figure 3-12 shows the plan for that telecommunications system. Access to real-time transportation information on major roads and transit services in Arizona have already been implemented via the 511 automated telephone answering system.

3.1.1.6 Vehicle Miles of Travel

The total vehicle miles of travel (VMT) on roadways in the portion of the study area covered by the MAG travel model is shown in Table 3-6. The table shows estimated current VMT, as well as forecast VMT on the LRTP for 2020 and 2030, by facility type. The table shows that current weekday VMT in the portion of the study area covered by the MAG traffic model is 14.5 million miles. In the year 2020 VMT on the LRTP roadway network is forecast at 37.6 million miles, growing to 53.2 million miles in 2030.

Table 3-6
Current 2002 Base Network and LRTP Based Reference Network:
Daily Vehicle Miles of Travel by Facility Type: 2002, 2020, and 2030

Facility Type	Current Base 2002	LRTP 2020	LRTP 2030
Freeway	7,151,995	12,137,227	14,856,310
Expressway	388,532	2,663,287	3,038,593
Arterial	6,870,346	22,435,342	34,870,689
Collector	86,303	350,646	452,913
Total	14,497,175	37,586,502	53,218,505

Source: MAG

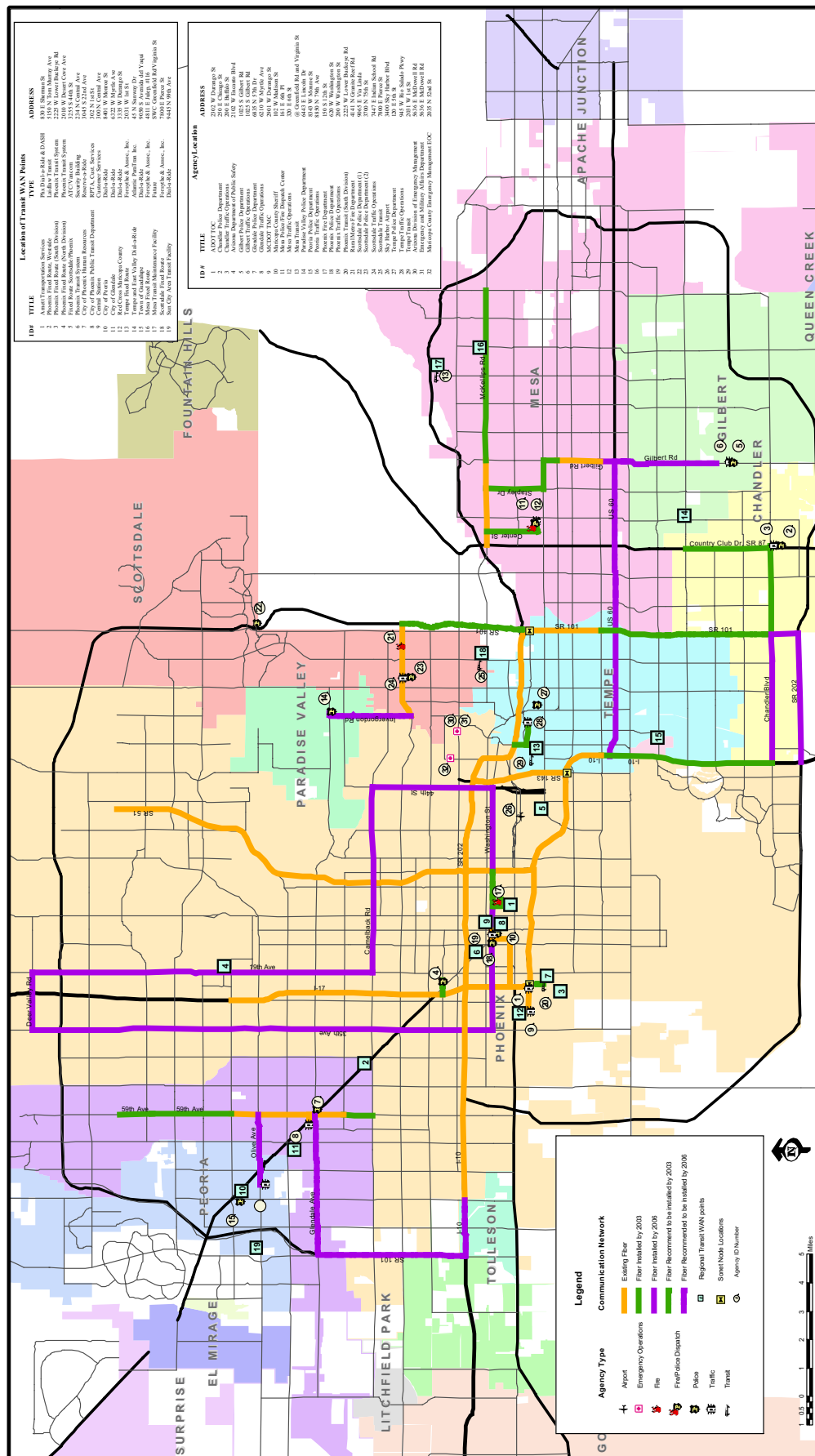


Figure 3-12

MAG ITS Strategic Plan Update - November 2000

ITS Telecommunications Plan

Weekday truck travel is shown in Table 3-7. An estimated 3.8 million vehicle miles of truck travel currently occur in the SWATS area. In 2020 that amount is forecast to increase to 9.4 million, with further growth to 13.0 million in 2030.

Table 3-7
Current 2002 Base Network and LRTP Based Reference Network:
Truck Miles of Travel by Facility Type: 2002, 2020, and 2030

Facility Type	Current Base 2002	LRTP 2020	LRTP 2030
Freeway	1,951,141	3,182,836	3,974,190
Expressway	102,628	961,038	1,041,947
Arterial	1,692,490	5,160,140	7,849,686
Collector	17,810	81,358	112,593
Total	3,764,070	9,385,372	12,978,416

Source: MAG

In the peak hour of weekday traffic, current VMT is estimated at 765,000 vehicle miles, as shown in Table 3-8. The forecast of peak hour VMT in 2020 on the LRTP roadway network is just over 2 million, growing to 2.9 million in 2030.

Table 3-8
Current 2002 Base Network and LRTP Based Reference Network:
Peak Hour Vehicle Miles of Travel by Facility Type: 2002, 2020, and 2030

Facility Type	Current Base 2002	LRTP 2020	LRTP 2030
Freeway	337,282	616,052	708,938
Expressway	22,013	113,879	140,093
Arterial	400,007	1,276,556	2,039,333
Collector	6,106	19,024	25,425
Total	765,409	2,025,510	2,913,789

Source: MAG

3.1.1.7 Traffic Volumes

Recent mid-block traffic volume data were collected from ADOT and MCDOT. Volume data collected typically did not distinguish between vehicle types, and did not indicate if seasonal or other correction factors had been applied. Figure 3-13 shows recent traffic volume data collected in the field.

Figure 3-14 shows current daily volumes for the freeway network in the study area estimated by MAG. Figure 3-15 and Figure 3-16 show volumes forecast by MAG on the freeways of the LRTP roadway network for 2020 and 2030, respectively. A comparison of these three figures shows steady volumes increases through 2030. The highest volumes are generally found closer to central Phoenix with volumes generally falling off with increasing distance from the downtown.

Figure 3-17 shows current daily volumes for the arterial network in the study area estimated by MAG. Figure 3-18 and Figure 3-19 show volumes forecast by MAG on the arterials of the LRTP roadway network for 2020 and 2030, respectively.

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Figure 3-13
Recent Traffic Counts

All Counts are One-Way

Year and Source:

- MCDOT 1998
- MCDOT 1999
- MCDOT 2000
- MCDOT 2001
- ▲ ADOT 2000

10,000 Count

Study Area Boundary

Source: Maricopa Association of Governments, ADOT

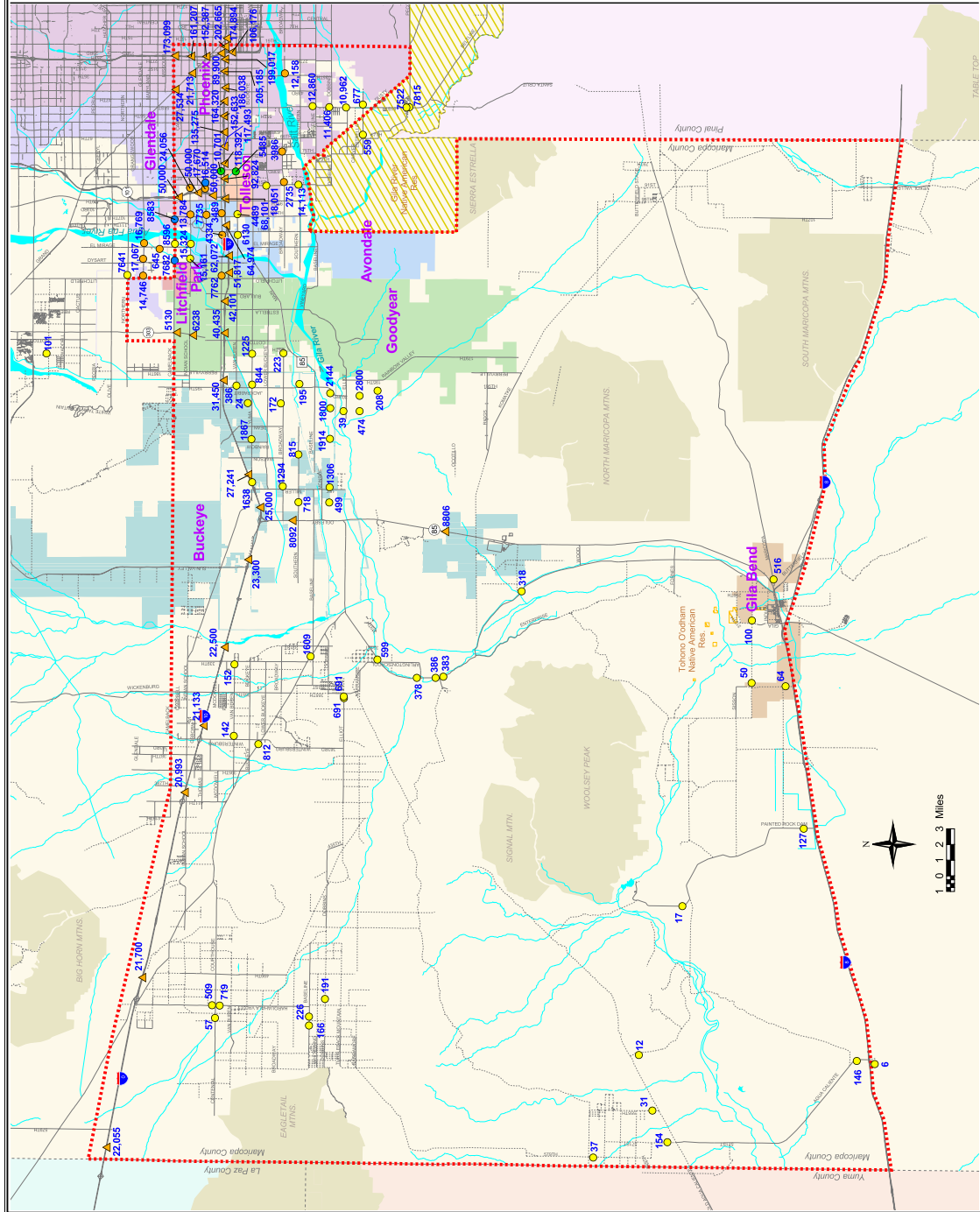


Figure 3-14
Freeway Daily Traffic Volumes: Current Base 2002

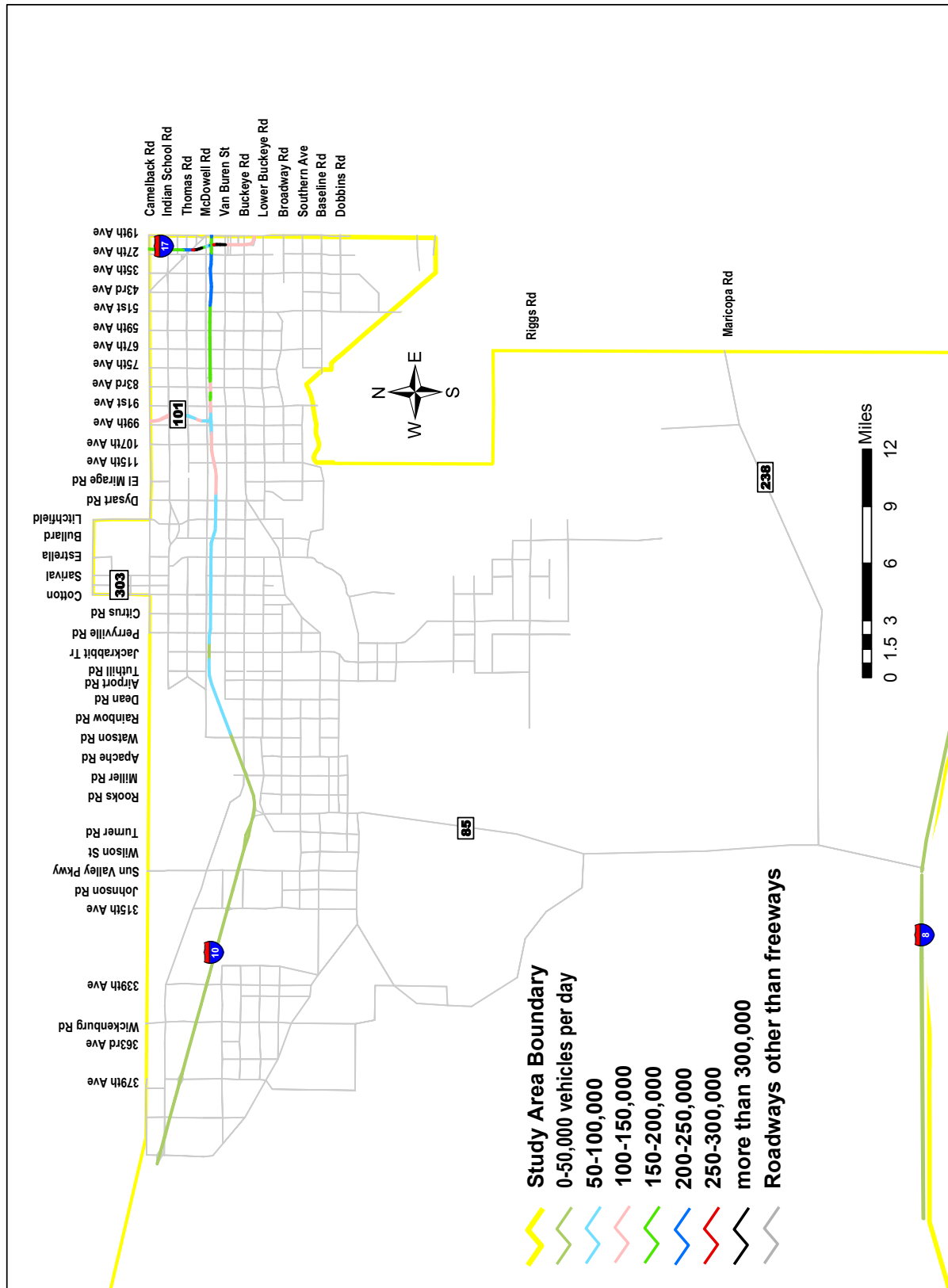


Figure 3-15
Freeway Daily Traffic Volumes: LRTP 2020

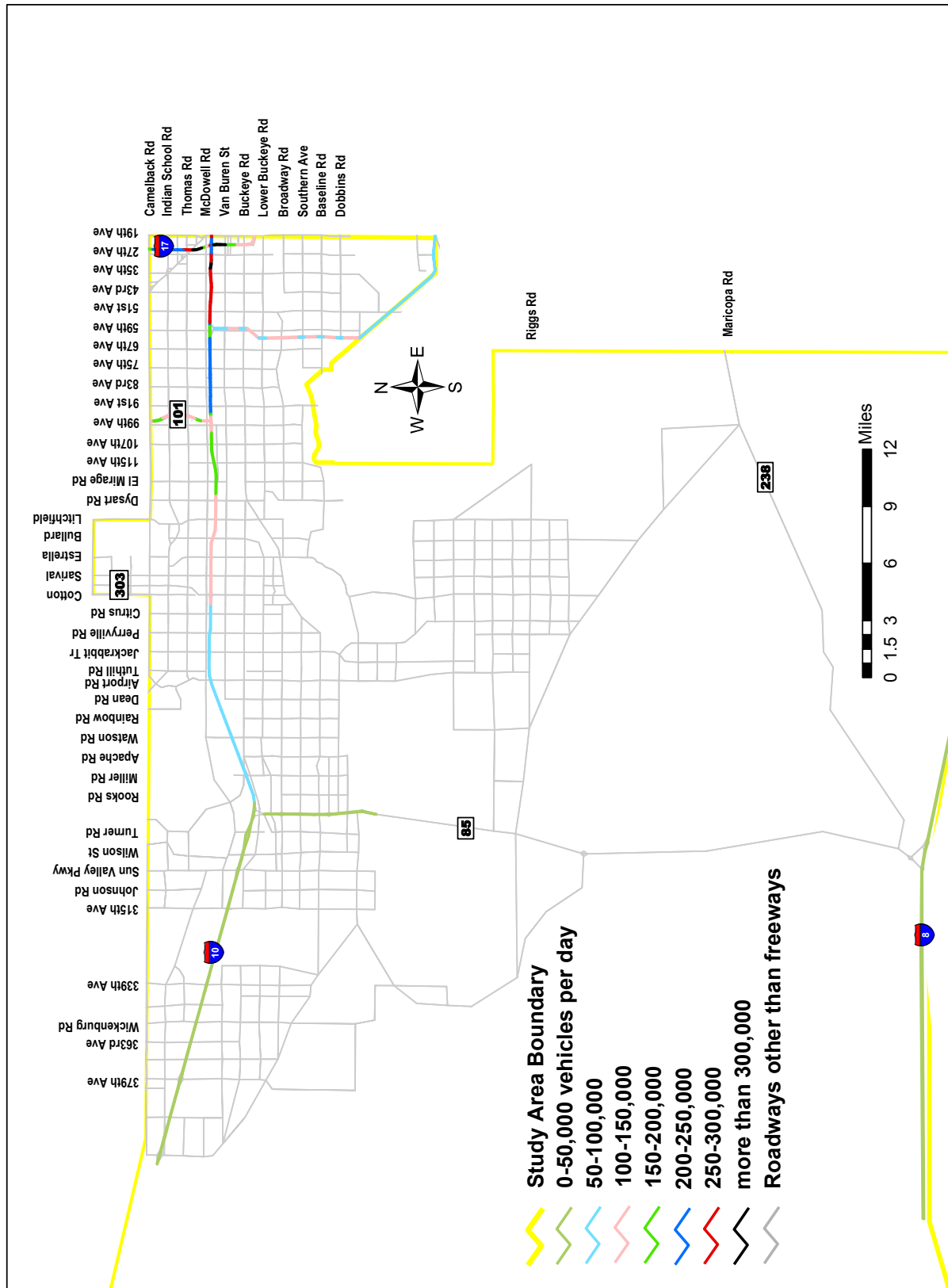


Figure 3-16
Freeway Daily Traffic Volumes: L RTP 2030

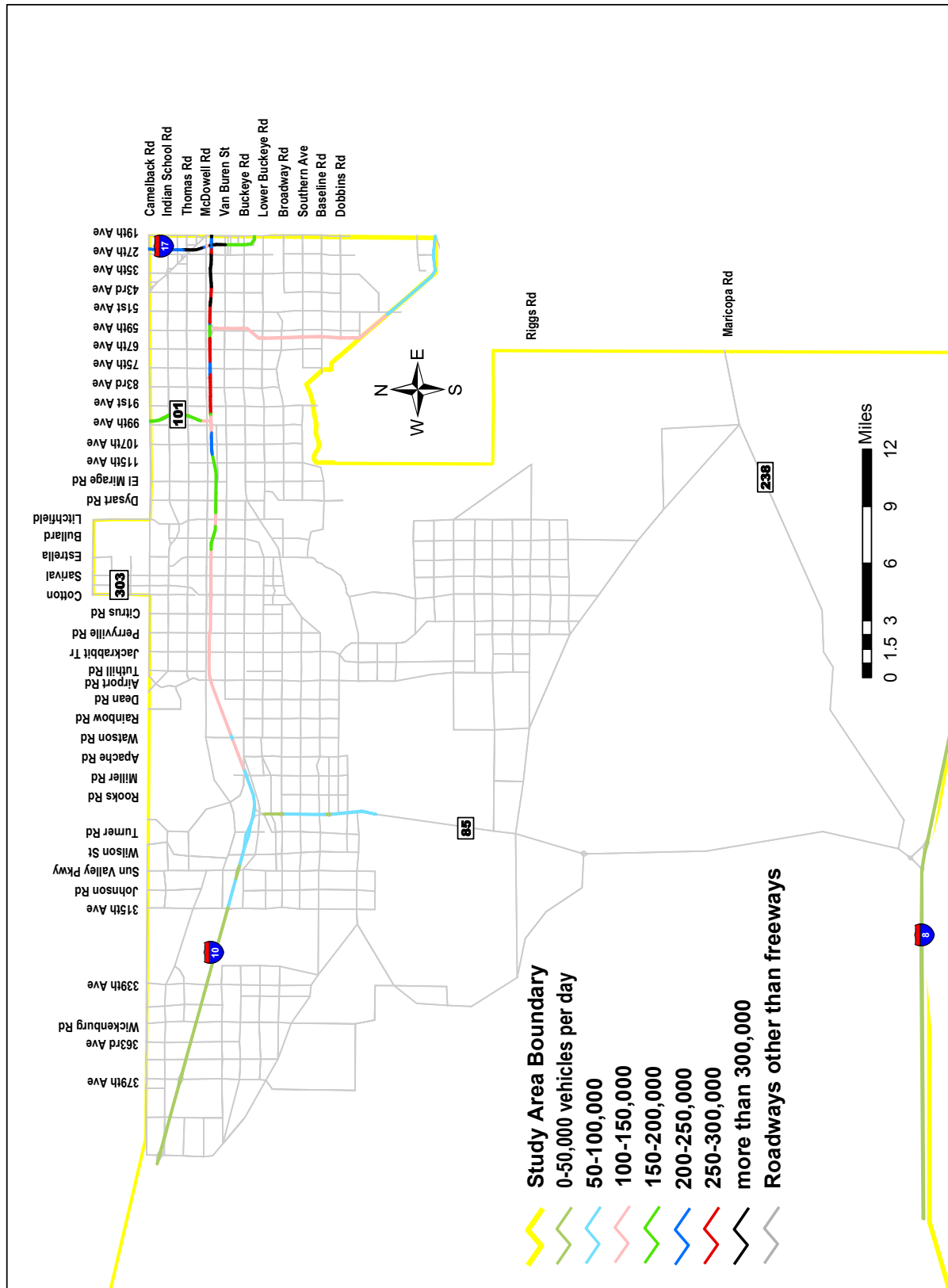


Figure 3-17
Off-Freeway Daily Traffic Volumes: Current Base 2002

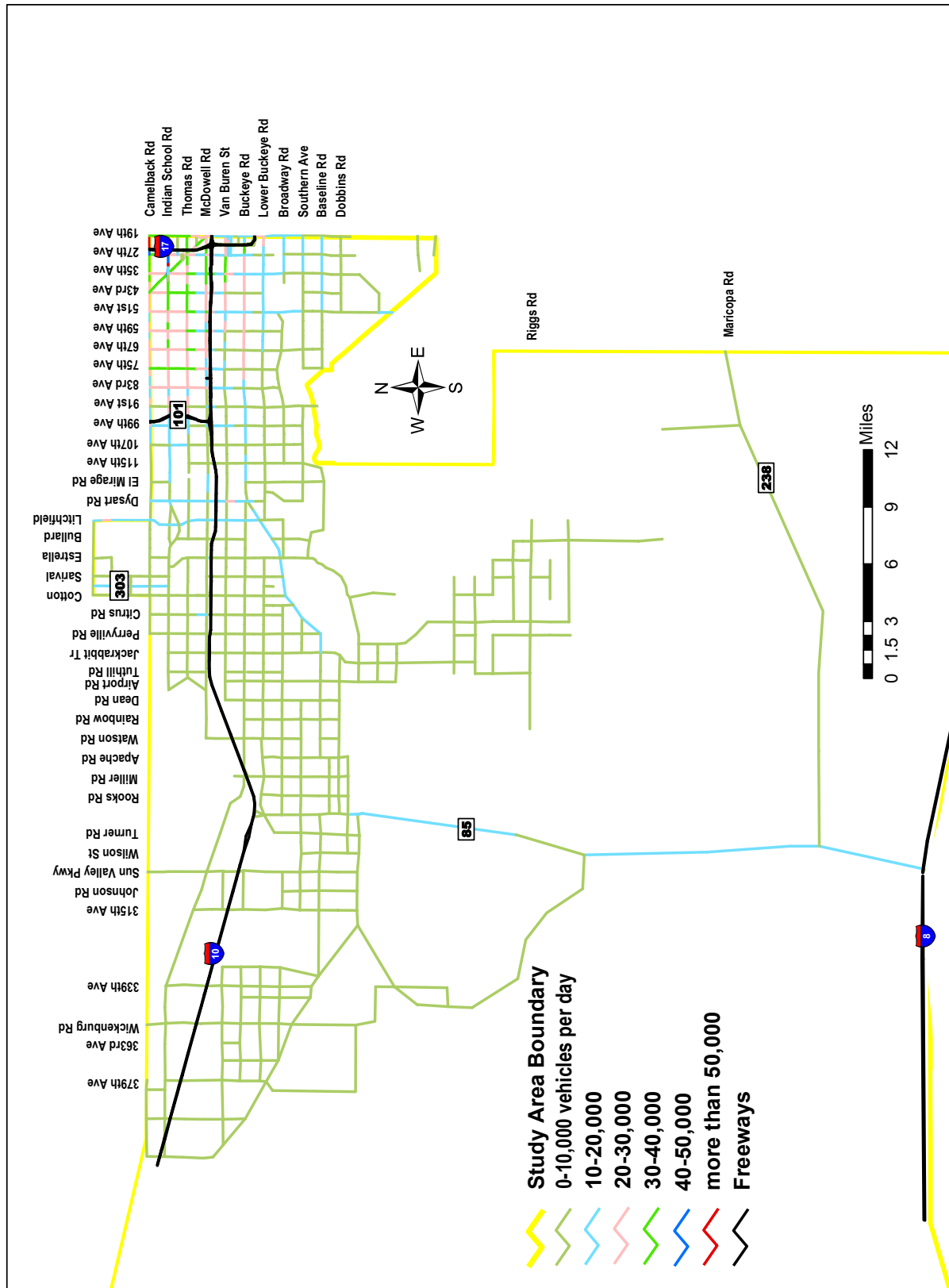


Figure 3-18
Off-Freeway Daily Traffic Volumes: LRTP 2020

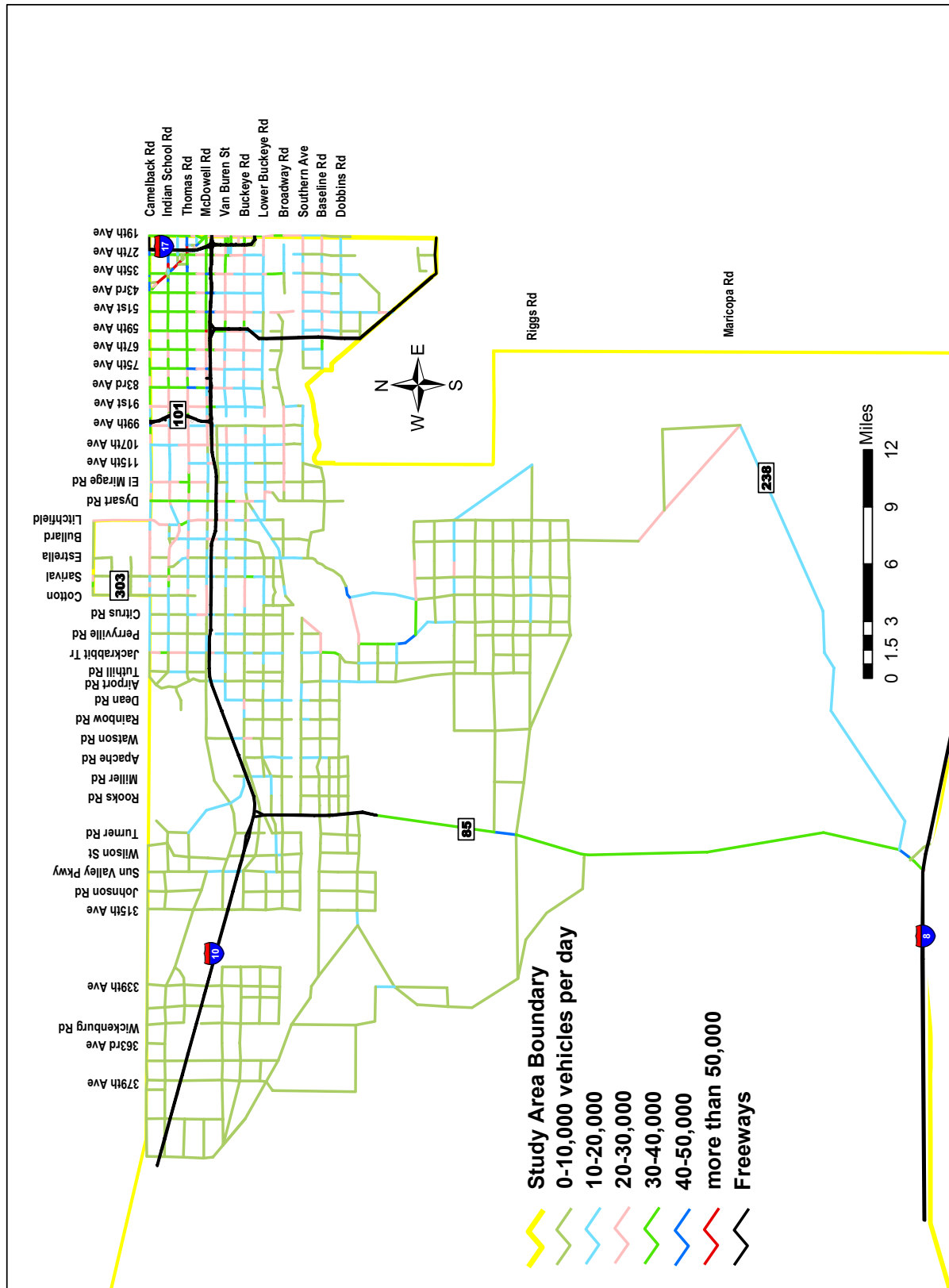
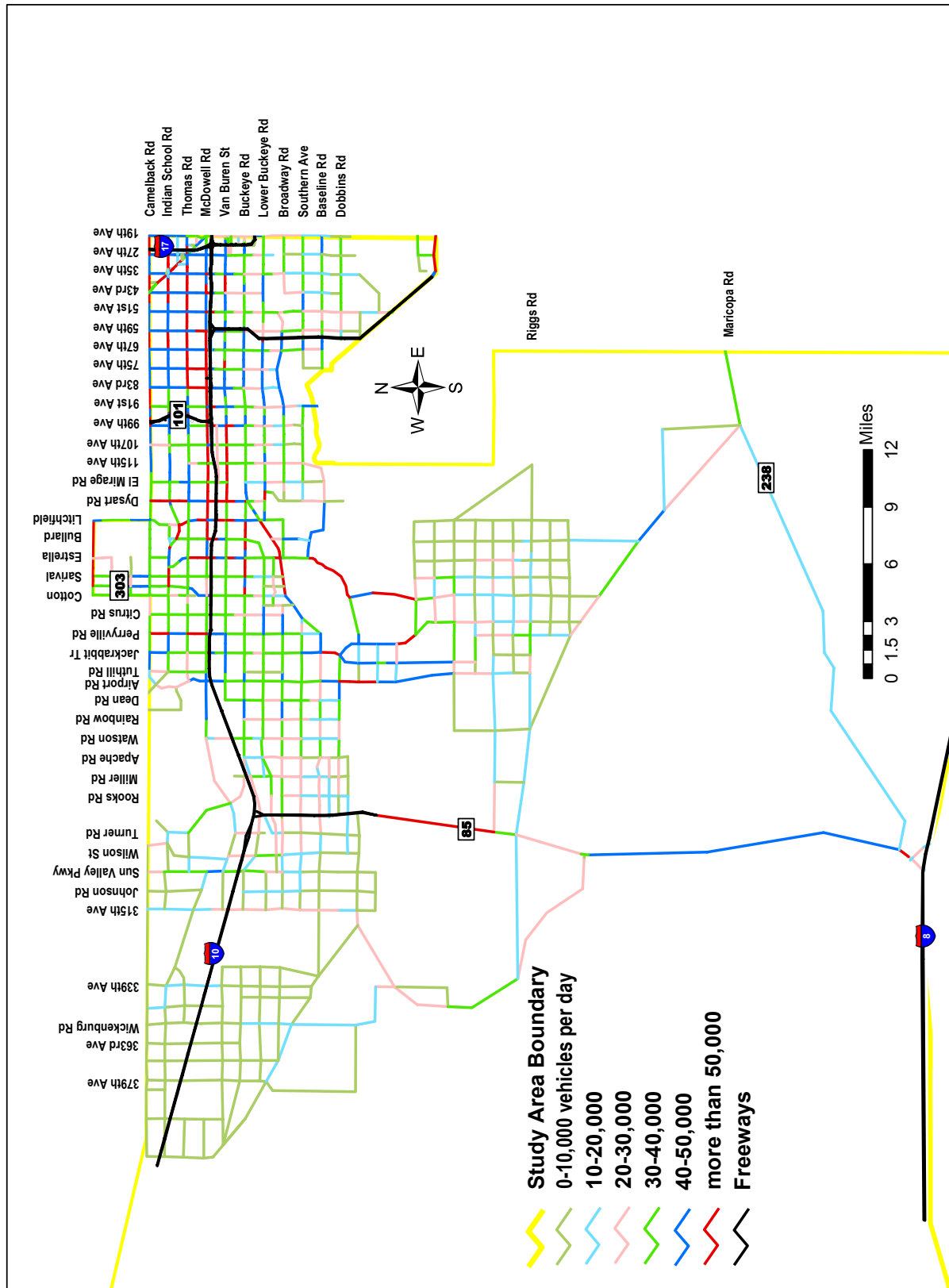


Figure 3-19
Off-Freeway Daily Traffic Volumes: LRTP 2030



Current daily truck volumes estimated by MAG are shown on Figure 3-20. Figure 3-21 and Figure 3-22 show truck volumes forecast by MAG on the roadways of the LRTP network for 2020 and 2030, respectively.

3.1.1.8 Current Delay and Level of Service Measures

Level-of-service is a measure of congestion and delay on roadways and at intersections. Level-of-service is graded based on an A to F scale, where level A is an uncongested free-flow of traffic and level F is jammed flow. Different techniques are employed to estimate the level-of-service of intersections, stretches of arterials, and freeways. Figure 3-23 shows the estimate of current peak hour level-of-service for each of the arterial and freeway links in the SWATS area. Figure 3-24 shows the forecast peak hour level-of-service for the study area in 2020 on the LRTP roadway network. Figure 3-25 shows the forecast level-of-service for the study area in 2030.

Figure 3-26 shows the estimate of current peak hour level-of-service for many of the intersections in the SWATS area. Figure 3-27 shows the 2020 forecast peak hour level-of-service for intersections in the LRTP roadway network. Figure 3-28 shows the 2030 forecast.

The figures show a steady increase in the number of roadway links and intersections operating at the unacceptable levels-of-service E and F during the peak hour. Table 3-9 compares the number of intersections and miles of roadway operating with unacceptable (E&F) levels-of-service.

Table 3-9
Directional Roadway Miles and Intersections
Operating at LOS E and F: 2002, 2020, and 2030

Facility	Current Base 2002	LRTP 2020	LRTP 2030
Directional Roadway Miles	75	255	749
Percent of Directional Miles	4%	10%	29%
Arterial Intersections	22	134	301
Intersections Analyzed	476	646	646
Percent of Intersections Analyzed	5%	21%	47%

Source: MAG

3.1.1.9 Motor Vehicle Accident Data

Recent roadway motor vehicle accident data were collected from ADOT. The only data uniformly available for the study area are annual numbers of motor vehicle accidents by jurisdiction by severity. Data for the three year period 1999-2001 are presented in Table 3-10. Jurisdictional population data are also presented from 2000 and accident rates per 1,000 population are calculated. (Both accident and population data are for entire jurisdictions, even though some jurisdictions are only partially within the study area.

These data must be interpreted carefully. They do not indicate that any one roadway or specific location in the study area has an unusually high rate of accidents. Accident rates, generally presented as number of accidents per million miles of vehicle travel or per million vehicles entering an intersection, are the best measure of whether a specific location has an unusually high rate of accidents. Accident rate data are not available for the study area.

Figure 3-20
Daily Truck Volumes: Current Base Network 2002

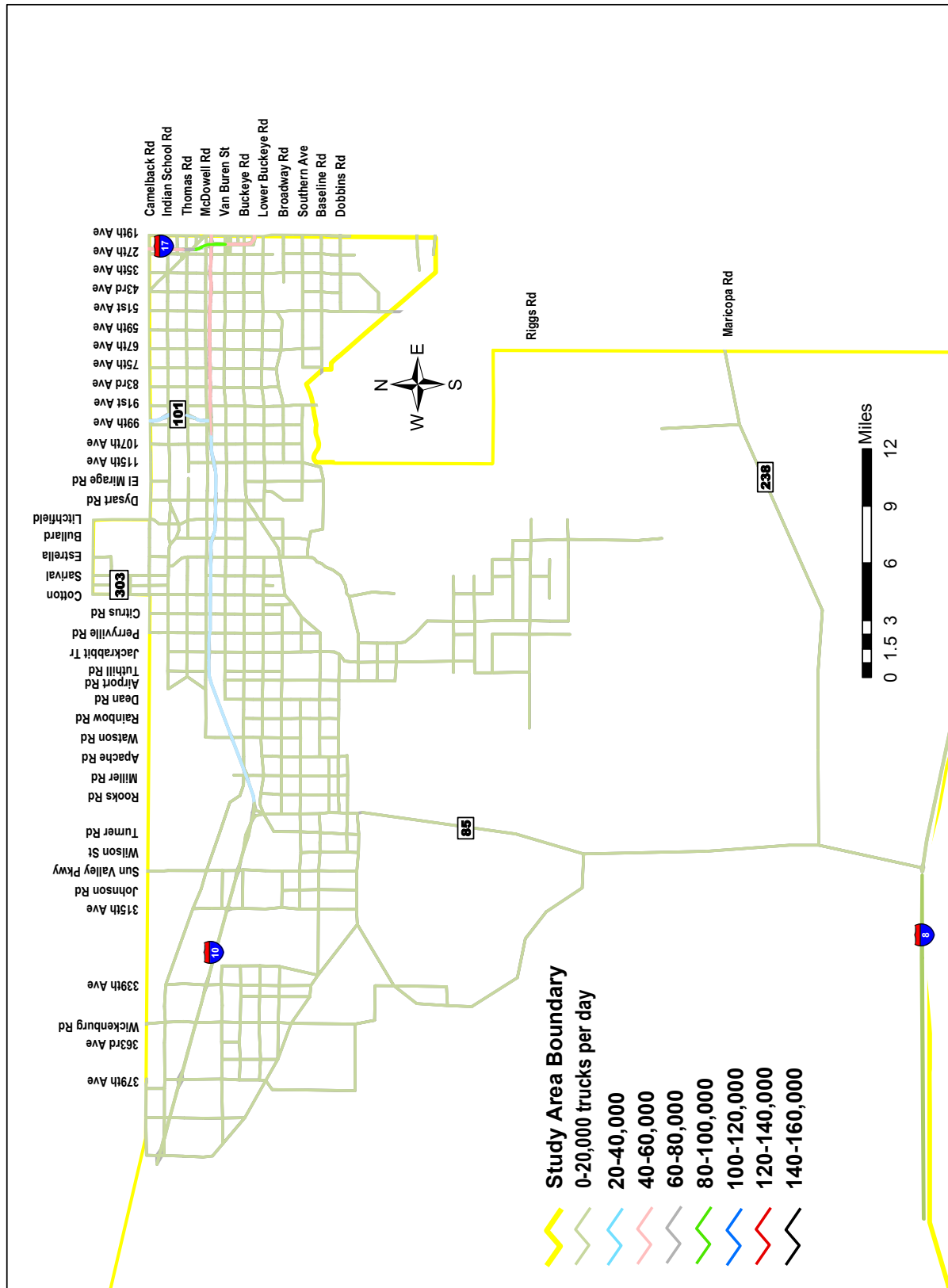


Figure 3-21
Daily Truck Volumes: L RTP 2020

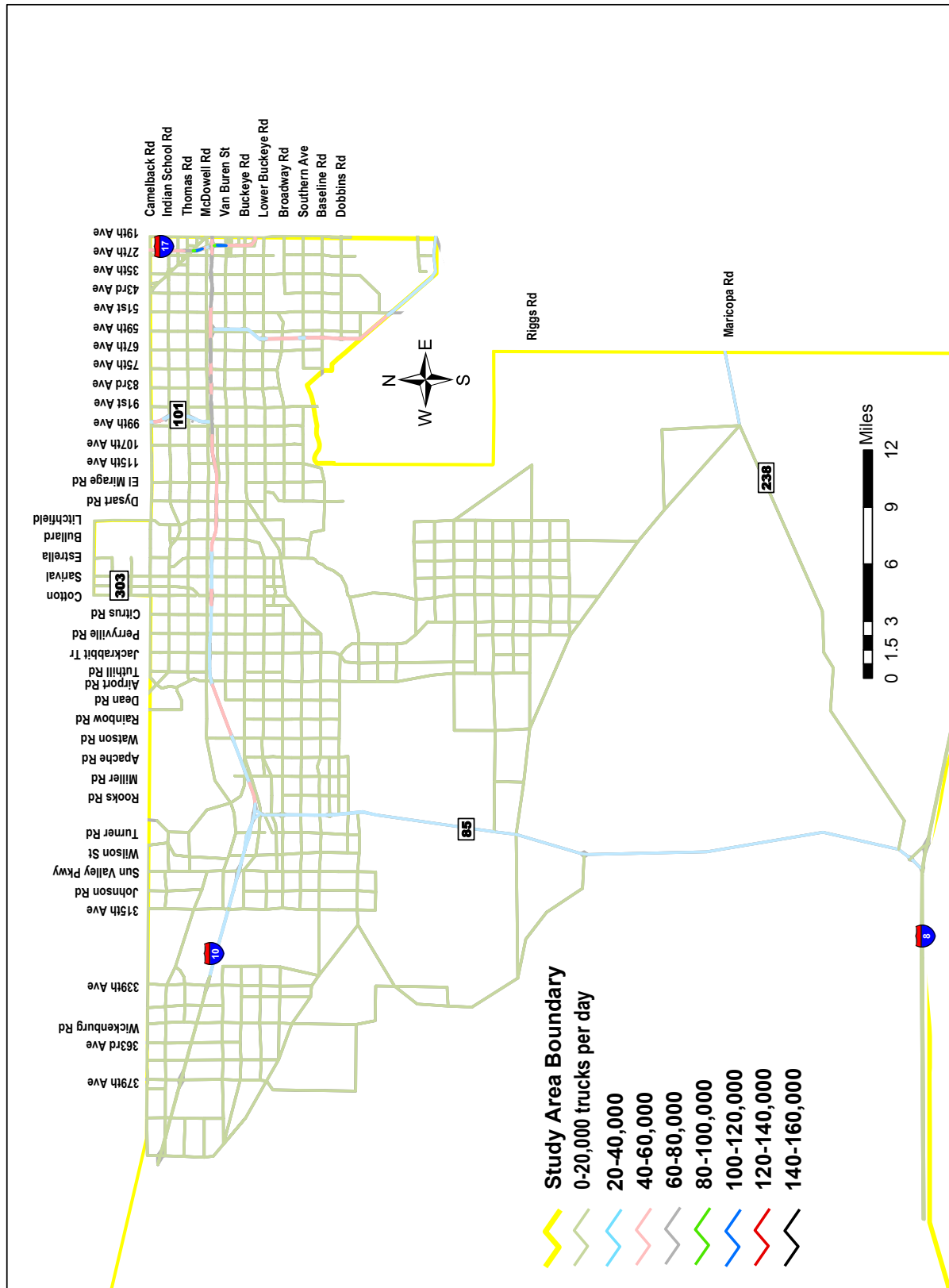


Figure 3-22
Daily Truck Volumes: L RTP 2030

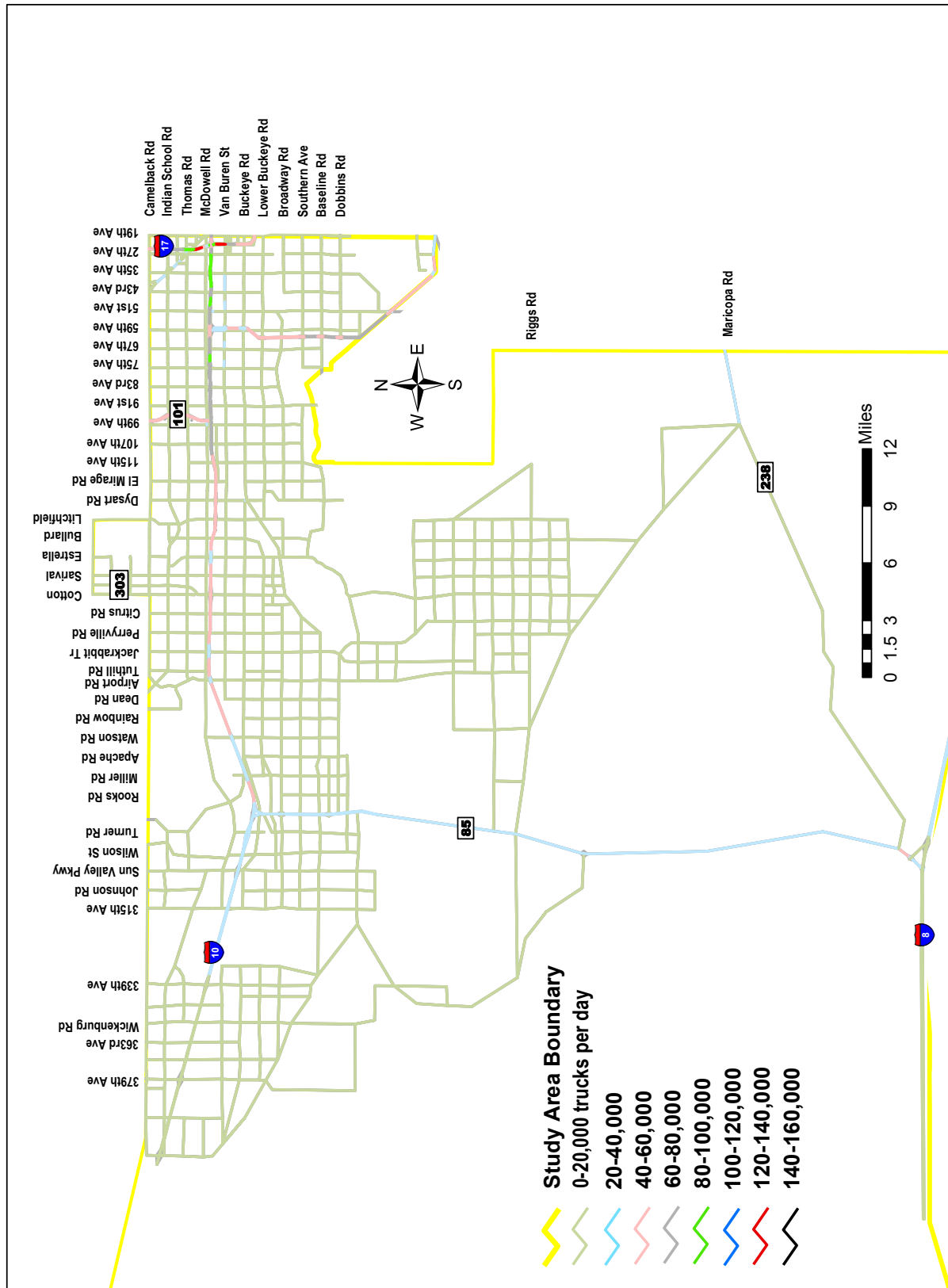


Figure 3-23
Roadway Level-of-Service: Current Base 2002

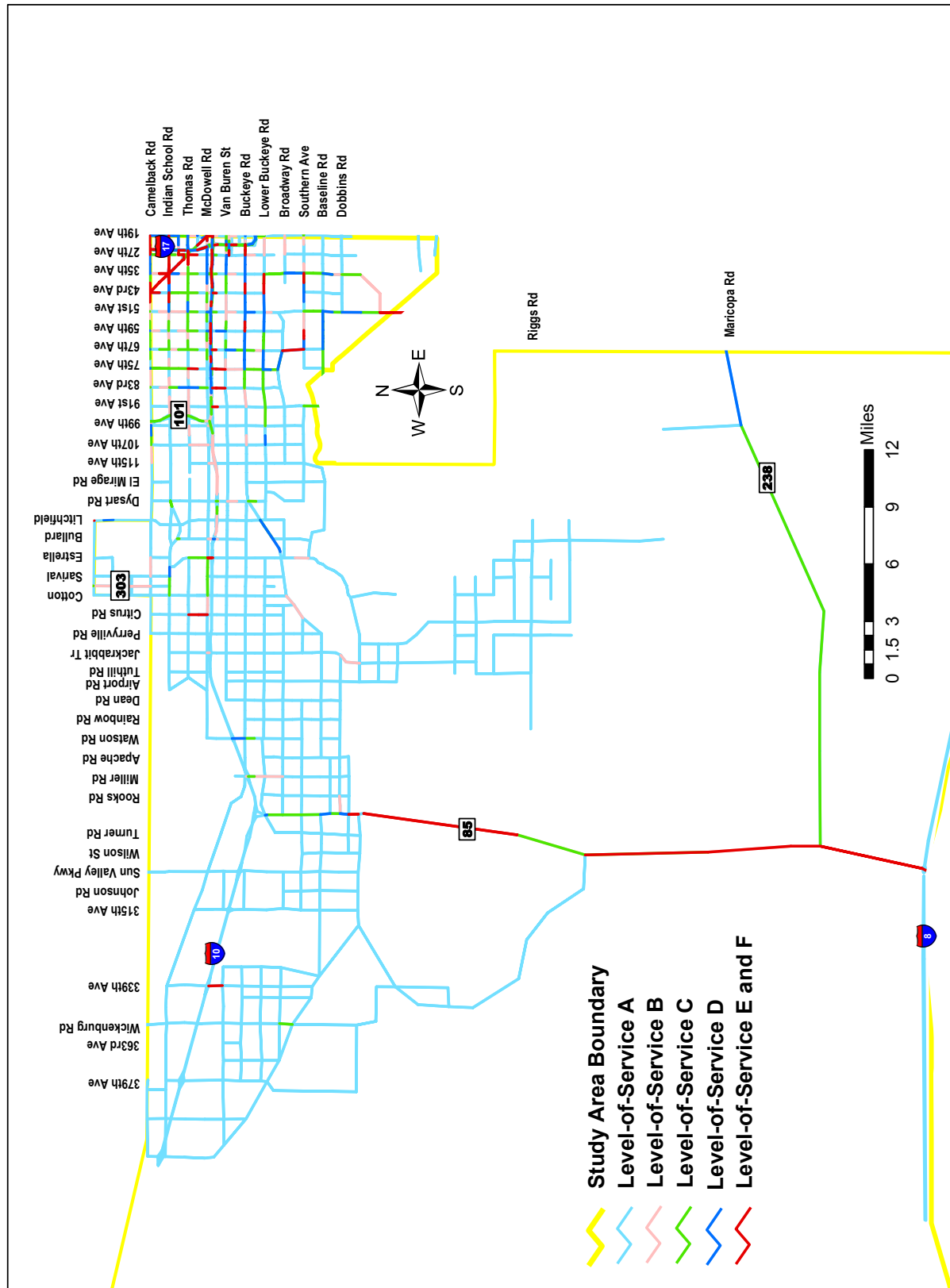


Figure 3-24
Roadway Level-of-Service: LRTP 2020

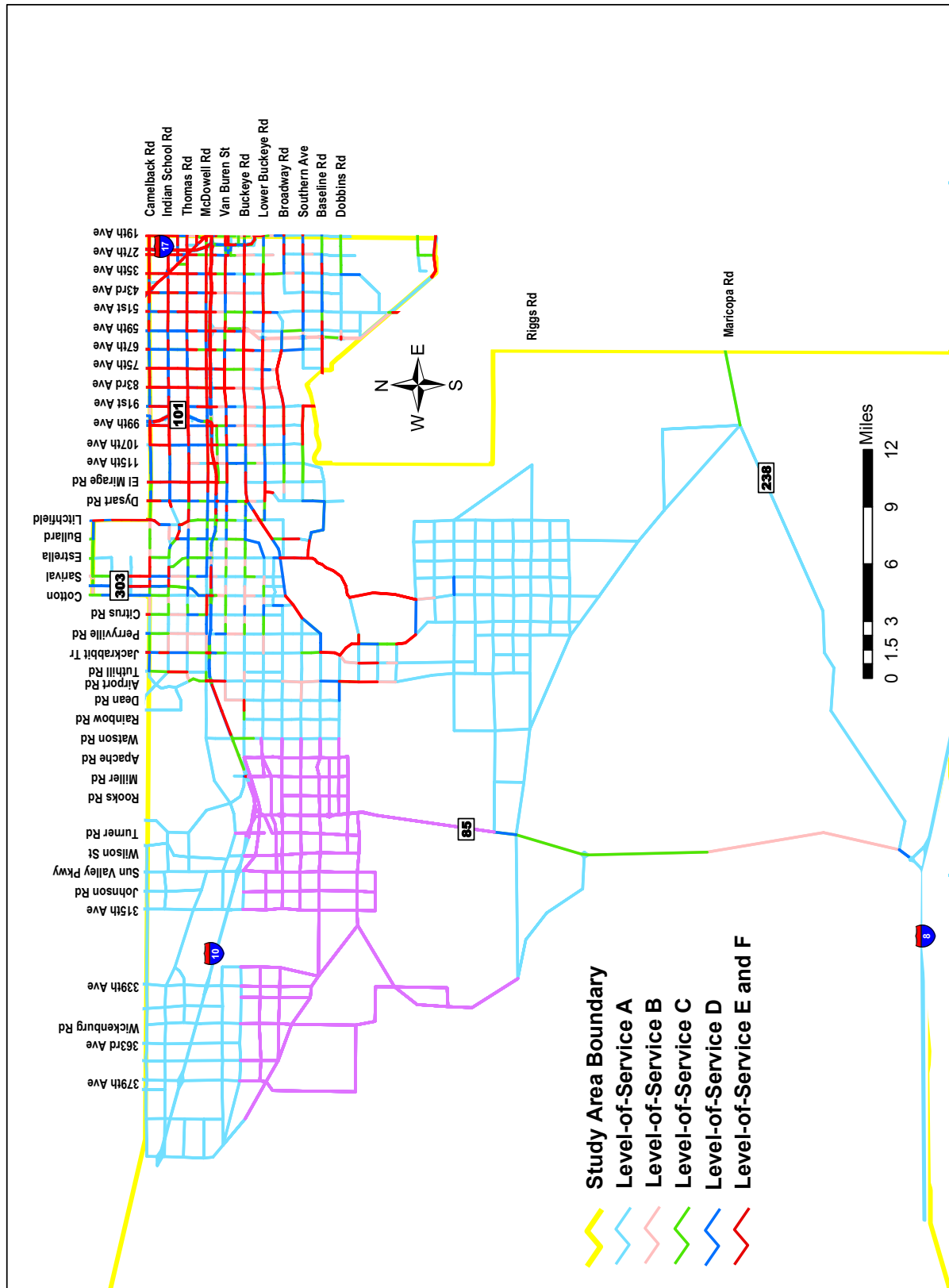


Figure 3-25
Roadway Level-of-Service: LRTP 2030

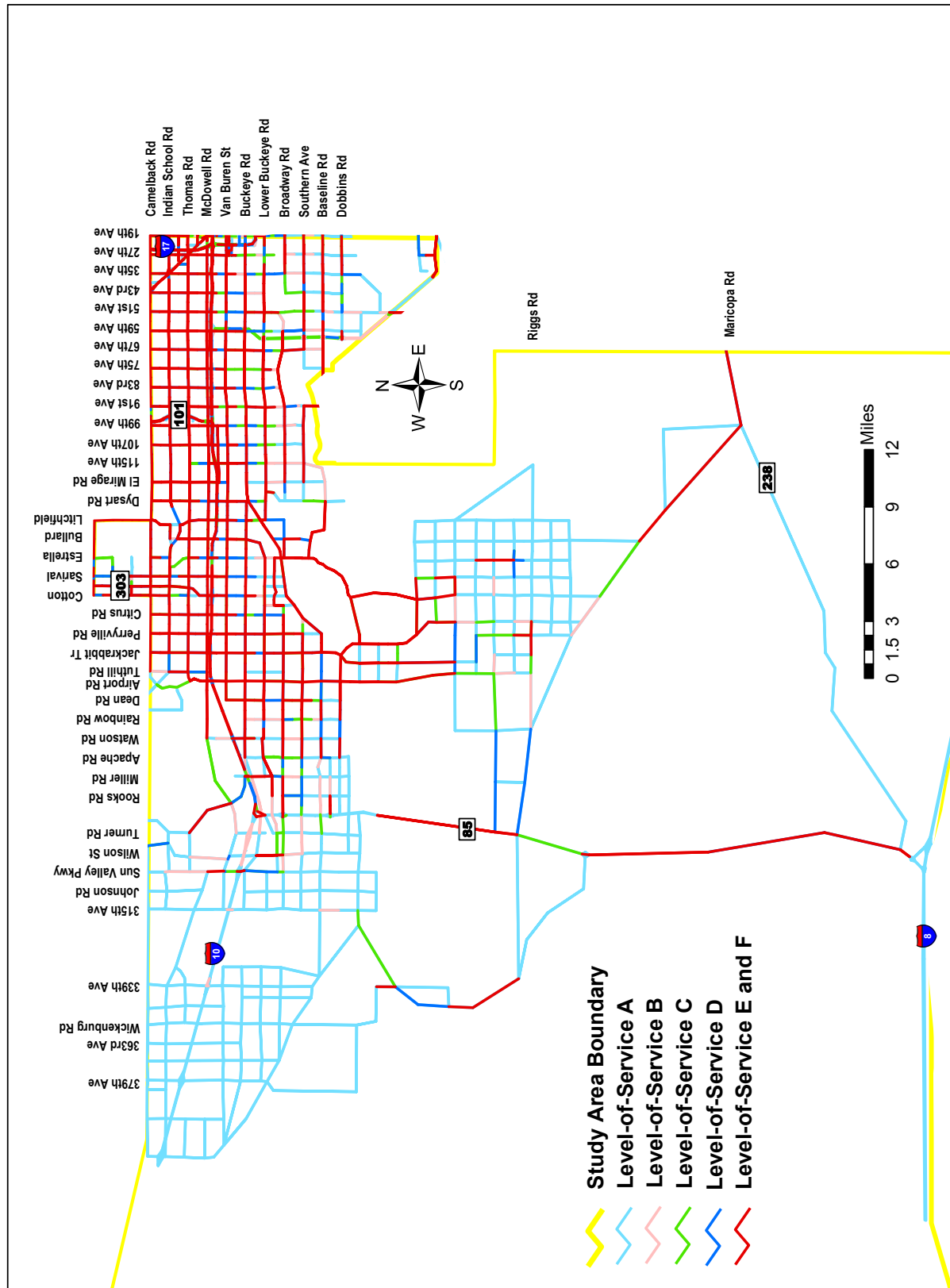


Figure 3-26
Intersection Level-of-Service: Current Base 2002

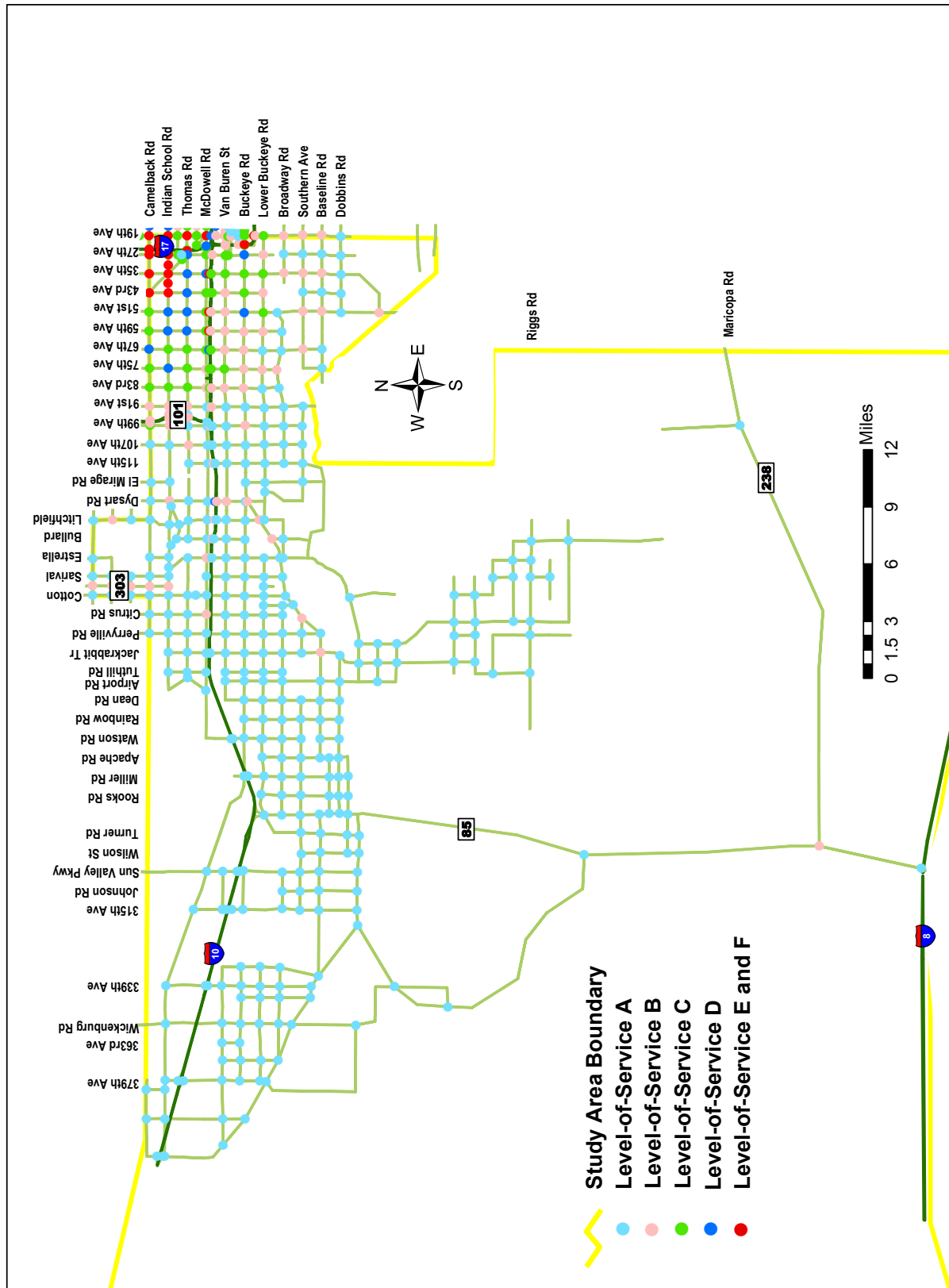


Figure 3-27
Intersection Level-of-Service: LRTP 2020

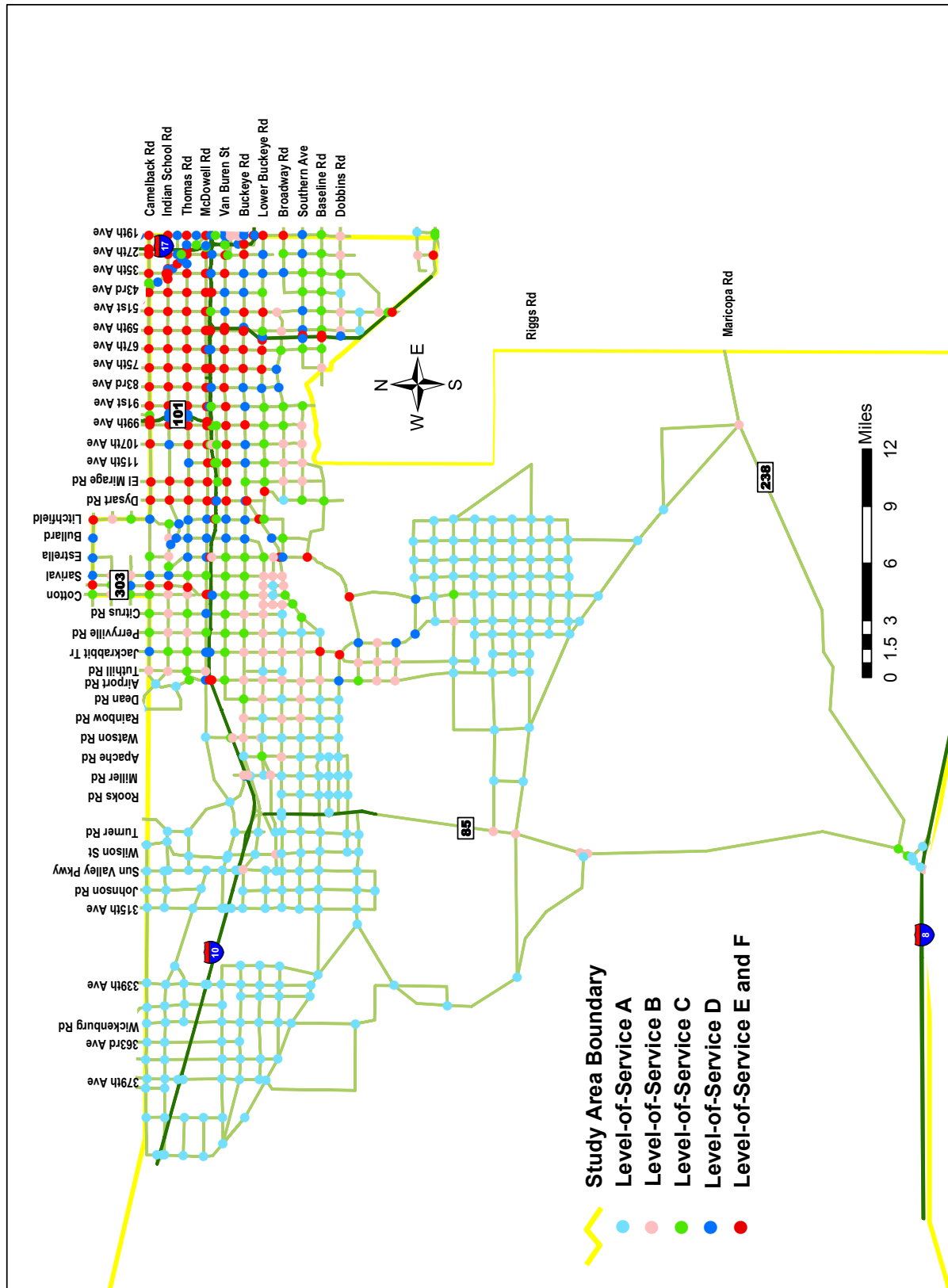


Figure 3-28
 Intersection Level-of-Service: LRTP 2030

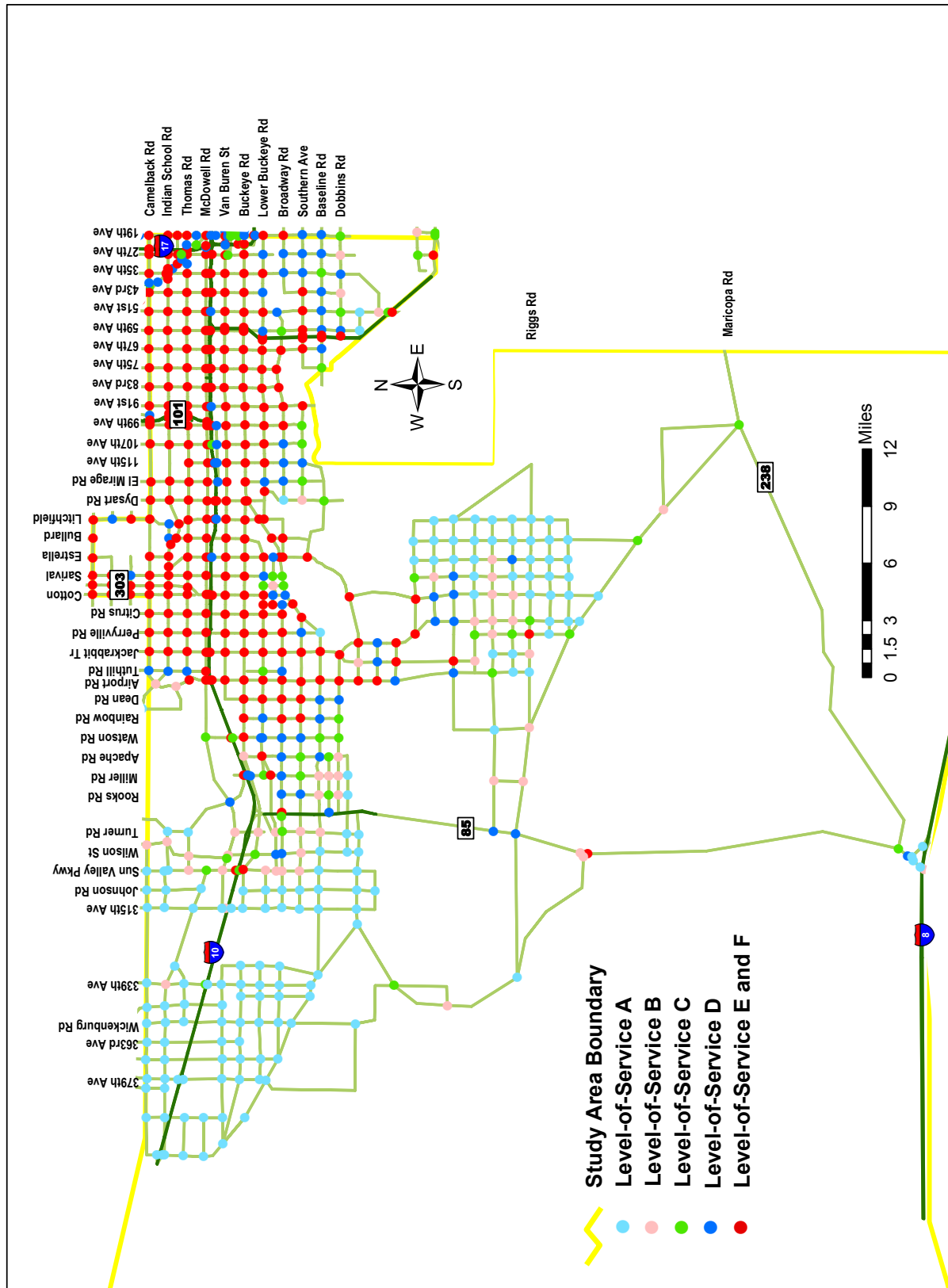


Table 3-10
Motor Vehicle Accidents by Jurisdiction 1999-2001

Jurisdiction	Annual Average Motor Vehicle Accidents				2000 Population	Annual Average Motor Vehicle Accidents per 1000 Population			
	Fatal	Injury	Property	Total		Fatal	Injury	Property	Total
Gila Bend	0	4	15	20	1,980	0.168	2.020	7.744	9.933
Litchfield Park	1	22	32	55	3,810	0.262	5.774	8.399	14.436
Tolleson	0	48	96	144	4,974	0.000	9.650	19.367	29.018
Buckeye	3	28	37	67	6,537	0.459	4.207	5.584	10.249
Goodyear	4	99	186	289	18,911	0.229	5.253	9.818	15.300
Avondale	4	158	368	530	35,883	0.102	4.412	10.246	14.761
Glendale	18	1,604	2,894	4,516	218,812	0.082	7.332	13.226	20.640
Phoenix	190	16,798	26,296	43,284	1,324,045	0.143	12.687	19.861	32.691

Buckeye data are for 2000 and 2001 only and Litchfield Park data are for 2001 only.

The data in Table 3-10 show three types of accidents: those involving a fatality, those involving a personal injury (but not a fatality), and those involving only property damage. Except for Litchfield Park and, especially, Tolleson, the total number of accidents per person generally increases with population size. This is not unexpected in that larger population centers tend to have more motor vehicles, denser development, and thus more opportunity for conflict among motor vehicles and between motor vehicles and pedestrians, bicycles, and fixed objects. There is no readily apparent reason why Tolleson has an accident rate per person nearly as high as the City of Phoenix. Data were only available for Litchfield Park for a single year (2001) and that year may have had an unusual number of motor vehicle accidents for some reason.

Table 3-11 shows an estimate of motor vehicle accidents in the SWATS area by severity and type of roadway facility. The estimate is based on accident rates estimated for the different types of roadway facilities with data from other jurisdictions. The table shows estimated number of crashes and their severity distribution for the LRTP network in 2020 and 2030. The Current Base is an estimate based

Table 3-11
Motor Vehicle Accidents:
Estimated for 2002 and Forecast for 2020 and 2030

Accident Type	Current Base	Future Base		Future Base	
	2002	2020	%Ch*	2030	%Ch*
Freeway Fatal	22	33	50	36	64
Freeway Injury	1,418	2,298	62	2,516	77
Freeway PDO**	3,480	5,668	63	6,209	78
Freeway Subtotal	4,920	7,999	63	8,761	78
Other Segment Fatal	74	148	100	192	159
Other Segment Injury	6,699	13,717	105	17,972	168
Other Segment PDO**	13,361	27,406	105	35,892	169
Other Segment Subtotal	20,134	41,271	105	54,056	168
Intersection	15,219	23,083	52	26,411	74
Total	40,273	72,353	80	89,228	122

*%Ch is percent change is from Current Base 2002. *Source: MAG*

**PDO: *Property Damage Only*

on the same crash rates used to estimate future year crashes and does not reflect the actual current crashes in the MAG region. Estimates for the Current Base are only for comparative purposes. The percent change (shown in the tables) for 2020 and 2030 is the percent change compared to the Current Base. The data estimate an 80 percent increase in motor vehicle accidents on the LRTP network in the SWATS area in 2020 and a 122 percent increase in 2030.

3.1.2 Public Transit

Public transit includes a variety of facilities and services. In addition to the traditional fixed route bus services, transit also includes other ridesharing alternatives, such as carpooling, vanpooling, and bikes on buses. It also includes dial-a-ride services and some paratransit services offered by social service agencies. Public transit does not include private services not open to the public such as airport shuttles to rental car agencies and hotels, condominium or homeowner association services providing services exclusively for their residents, and other similar services not available to the public. There are a plethora of such services and very little systematic collection of data on them. The following sections describe the public transit services available in the study area.

3.1.2.1 General Description

The RPTA is the predominant provider of public transit services in the SWATS area. There are other providers, including Greyhound, the Maricopa County Department of Human Services, and Southwest Transit and Regional Transportation (START). These agencies provide a variety of services including fixed route bus service (both local, express, and interstate), demand services such as dial-a-ride service for specialized populations, and ridesharing services.

3.1.2.2 Transit Routes and Services

The RPTA provides the bulk of the regular route transit service in the SWATS area on 19 bus routes. These routes are shown in Figure 3-29. Two express routes (the 560 and 561) provide peak hour service between downtown Phoenix and Desert Sky Mall via I-10. The 560 route continues to Tolleson and Avondale.

The 131 route (the START bus) complements the 560 and 561 routes by providing peak hour service, as well as midday service, between Desert Sky Mall and Litchfield Park via Tolleson and Avondale. The START provides service in the SWATS area on this one route. The route is managed by the RPTA as the 131 route. It is funded by jurisdictions in the southwest valley and Maricopa County's Work Links program. The 560 and 131 routes are the only RPTA regular route services west of 83rd Avenue.

The routes of the remaining 16 regular local bus routes in the SWATS area generally follow an arterial highway. The routes, the arterial that each follows, and the endpoints of the routes within the SWATS area are shown in Table 3-12. The table also shows the approximate headways during the peak hours, the number of miles of the route within the study area, and the percentage of the total route length within the study area.

Route 3 has two branches in the SWATS area. Half of the buses leave Van Buren Street at 35th Avenue, so that service on Van Buren Street west to 43rd Avenue is on 30 minute peak period headways. Similarly, Route 17 and Route 41 also have two branches. Half of the Route 17 buses on McDowell Road and half of the Route 41 buses on Indian School Road leave those arterials at 51st Avenue, thus reducing the peak period headways on those routes west to 83rd Avenue to 30 minutes.

Route 10 is exceptional in that its route is not dominated by service on a single major arterial. The

Southwest Area Transportation Study

Figure 3-29
Existing Transit Service Routes and
Service Areas

- Existing Bus Service
(Valley METRO)
- Existing Dial-a-ride Service
- ADA Only
- General Public
- Seniors & Disabled
- Existing Freight Rail Service
- Study Area Boundary

Source: Valley METRO Regional Public
Transportation Authority (RPTA); City of
Phoenix Public Transportation Department

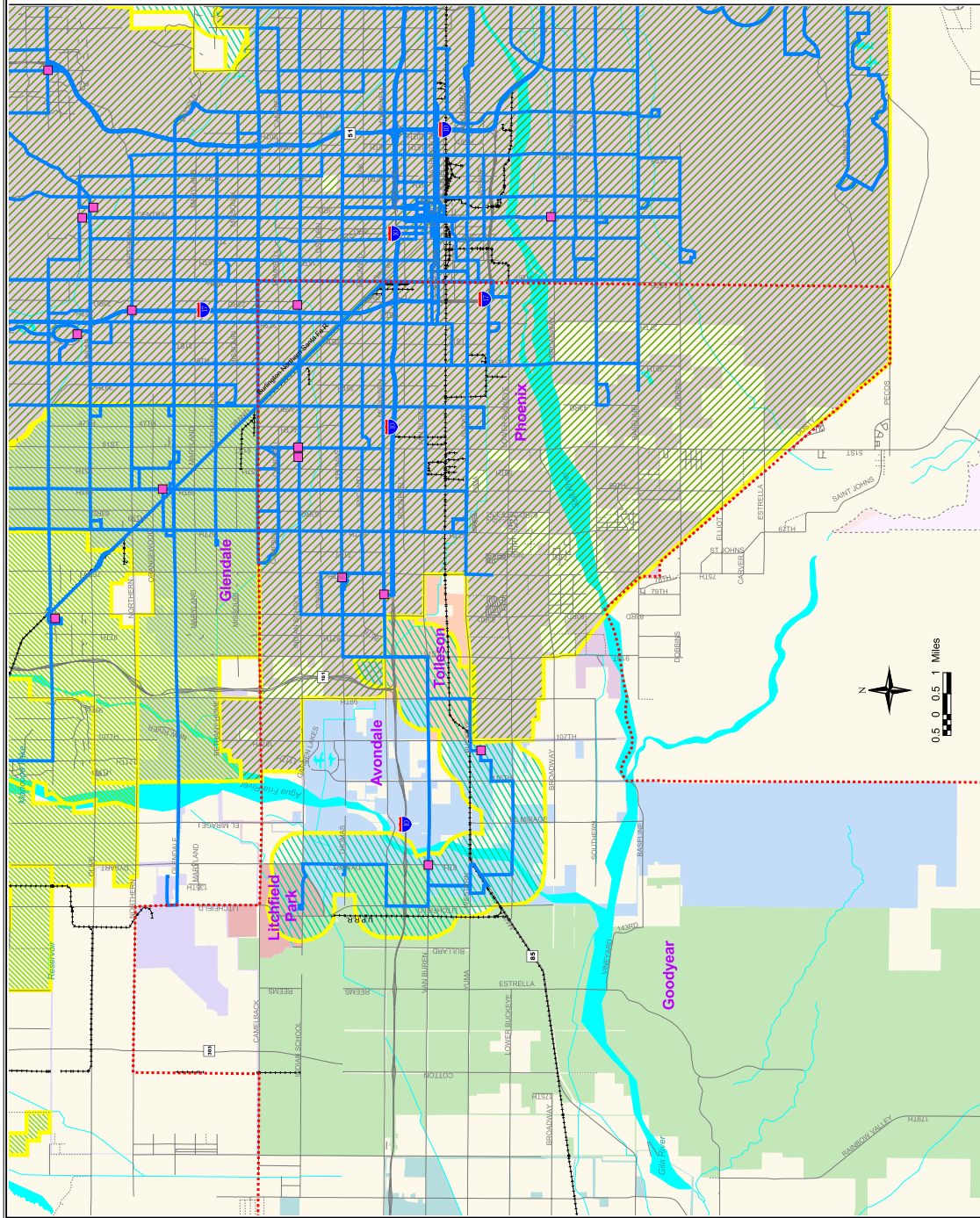


Table 3-12
RPTA Transit Routes

Route	Arterial Served	SWATS End Points	Type Service	Mileage of Route within SWATS	Percent of Route within SWATS	Peak Period Headway in Minutes
3	Van Buren Street	67th Avenue	Local	7.93	33	15
10	Durango Road	22nd Avenue	Local	4.88	27	30
13	Buckeye Road	75th Avenue	Local	7.67	42	35
17	McDowell Road	83rd Avenue	Local	15.44	49	15
19	19th Avenue	Baseline Road	Local	12.60	46	15
27	27th Avenue	Jefferson Street	Local	6.41	27	30
35	35th Avenue	Baseline Road	Local	11.44	43	20
41	Indian School Road	83rd Avenue	Local	17.26	56	15
43	43rd Avenue	Mohave Street	Local	6.20	36	30
50	Camelback Road	67th Avenue	Local	7.48	32	15
59	59th Avenue	Buckeye Road	Local	6.95	37	30
61	Southern Avenue	43rd Avenue	Local	4.03	13	15
67	67th Avenue	Buckeye Road	Local	5.94	36	30
77	Baseline	39th Avenue	Local	2.68	14	30
131	Various	Litchfield Park and Desert Sky Mall	Local	19.49	100	70
560	Various	Avondale to Downtown Phoenix	Express	29.06	79	50
561	I-10	Desert Sky Mall to Downtown Phoenix	Express	31.19	81	25
Green	Desert Sky Mall	Thomas/Encanto	Local	16.45	55	10
Yellow	Grand Avenue	Downtown	Local	5.68	17	30

route enters the study area from Pima Street and proceeds south along 19th Avenue, turning west along Durango Street past Maricopa County's Durango Complex. The route then turns south along 35th Avenue from which it turns east onto Lower Buckeye Road.

Route 19 serving 19th Avenue provides 15 minute peak period headways north of Lower Buckeye Road, but only 30 minute headways south to Cesar Chavez High School west of 19th Avenue on Baseline Road.

Route 27 serves 27th Avenue north of Jefferson Street. Rather than continuing south on 27th Avenue, the route turns east to serve the State Capitol and downtown area.

There are a small number of routes which operate within the boundaries of the study area but provide either no or extremely limited service to the area. They have therefore been excluded from further consideration here. The Dash Route and Routes 45, 52, and 70 have turn around loops at their western ends. The former three use 19th Avenue as part of that loop and thus provide an extremely small amount of service to the study area west of the 19th Avenue study boundary. Similarly, Route 70 uses Litchfield Road adjacent to Luke AFB, which is within the study area, as part of its turnaround.

The Red Route touches the extreme northeast corner of the study area at the intersection of Camelback Road and 19th Avenue. While the study area lies to the southwest of that intersection, the Red Route approaches that intersection from the east and turns north at the intersection. Thus the amount of the study area served by the route is extremely small.

The Route 500 and 570 peak period express services are in the study area only from their common terminus at 22nd Avenue and Lower Buckeye Road until they enter the downtown area at Jefferson Street and 19th Avenue. The routes continue local service through downtown and then express to locations outside the study area. The Route 580 peak period express service provides local service on Jefferson and Adams Streets between 19th Avenue and I-17 before expressing north and out of the study area. Express service on Routes 581, 582, 590, and 591 operates within the study area. However, the routes are operated “closed door” as they express through a portion of the study area. No boardings or alightings are permitted in the SWATS area, so there is actually no service provided in the SWATS area.

The service area of regular transit route buses is generally considered to include the area within $\frac{1}{4}$ mile of the route. The time it takes a patron to walk $\frac{1}{4}$ mile to a transit stop is generally considered to be the average limit of time that patrons will tolerate to access transit. RPTA’s provision of bike racks on all of its regular route transit vehicles increases the service area for bicyclists, because a bicycle can cover more ground than a pedestrian in the same amount of time. The following analysis of transit service area population includes both population within $\frac{1}{4}$ and within $\frac{1}{2}$ mile of transit bus routes.

The population residing within $\frac{1}{4}$ mile of a local RPTA bus service (including the START Route 131) inside the study area in 2000 is estimated to be 225,371. Based on the 2000 SWATS area population estimate of 392,061, 57 percent of the SWATS area population is within the RPTA local bus service area. If the service area is expanded to the land within $\frac{1}{2}$ mile of a local RPTA bus route, the SWATS area population in the RPTA service increases to 285,074, or 73 percent of the SWATS population. The additional increment of population served by the “open door” component of RPTA express bus services is 11,832 for a $\frac{1}{4}$ mile service area and 7,004 for a $\frac{1}{2}$ mile service area.

The number of jobs located within $\frac{1}{4}$ mile of a local RPTA bus service inside the study area in 2000 is estimated to be 89,984. Based on the 2000 SWATS area employment estimate of 189,172, 48 percent of the SWATS area employment is within the RPTA local bus service area. If the service area is expanded to the land within $\frac{1}{2}$ mile of a local RPTA bus route, the SWATS area employment in the RPTA service area increases to 118,836, or 63 percent of the SWATS employment.

Complementary ADA services for the mobility impaired are provided by the RPTA to and from locations within $\frac{3}{4}$ of a mile of regular route service. This is a dial-a-ride service and is also provided along the START Route 131.

There are six park-and-ride facilities in the study area. These are shown on Figure 3-29. Each location provides a parking facility where bus patrons can park a car used to access the bus line. One facility is an express park-and-ride lot and is owned and operated by the RPTA. This parking lot is located adjacent to I-10 at 79th Avenue. From that parking lot express buses run into downtown Phoenix via the I-10 HOV (high occupancy vehicle) lanes. There is a dedicated set of ramps linking the lot to the HOV lanes, so that buses do not travel in mixed traffic from the lot to the HOV lanes.

The RPTA provides additional services to the study area. A carpool matching service is provided to identify potential carpool partners. This service is provided for all residents and employees in the

greater Phoenix area and is free. The RPTA also provides a variety of vanpool support services for larger, more regular, and more formal ridesharing. The vanpool services provided vary and some carry fees.

The Maricopa County Department of Human Services provides Specialized Transportation Services (STS) through two programs in the study area. The services are targeted primarily to the indigent, elderly, and disabled. The areas served by these programs include Avondale, Buckeye, Cashion, Gila Bend, and Tolleson. The STS Core Program provides transportation for medical appointments, senior center trips, shopping, and recreational purposes. The program also delivers meals for homebound individuals. The Work Links Program provides employment and employment related transportation services, including child care and medical transportation, to eligible participants for up to six months. The services are provided from 8:00 A.M. to 4:00 P.M. weekdays.

Greyhound has bus routes on I-8 and I-10 in the study area. The routes on I-8 serve Gila Bend twice daily in each direction with interregional service. Two routes provide service along the I-10 corridor in the SWATS area. Service on both routes is provided from Phoenix to Tolleson and Buckeye. From Buckeye service continues to either Gila Bend and Yuma or Blythe, California and points west on I-10. Six buses per day in each direction stop in downtown Tolleson and four per day in each direction stop in Buckeye on MC-85 at N. 4th Street. All of the buses serving Buckeye serve Tolleson, while three go on to Gila Bend and Yuma. The fourth bus serving Buckeye continues west to Blyth California and points west on I-10.

3.1.2.3 Future Transit Facilities

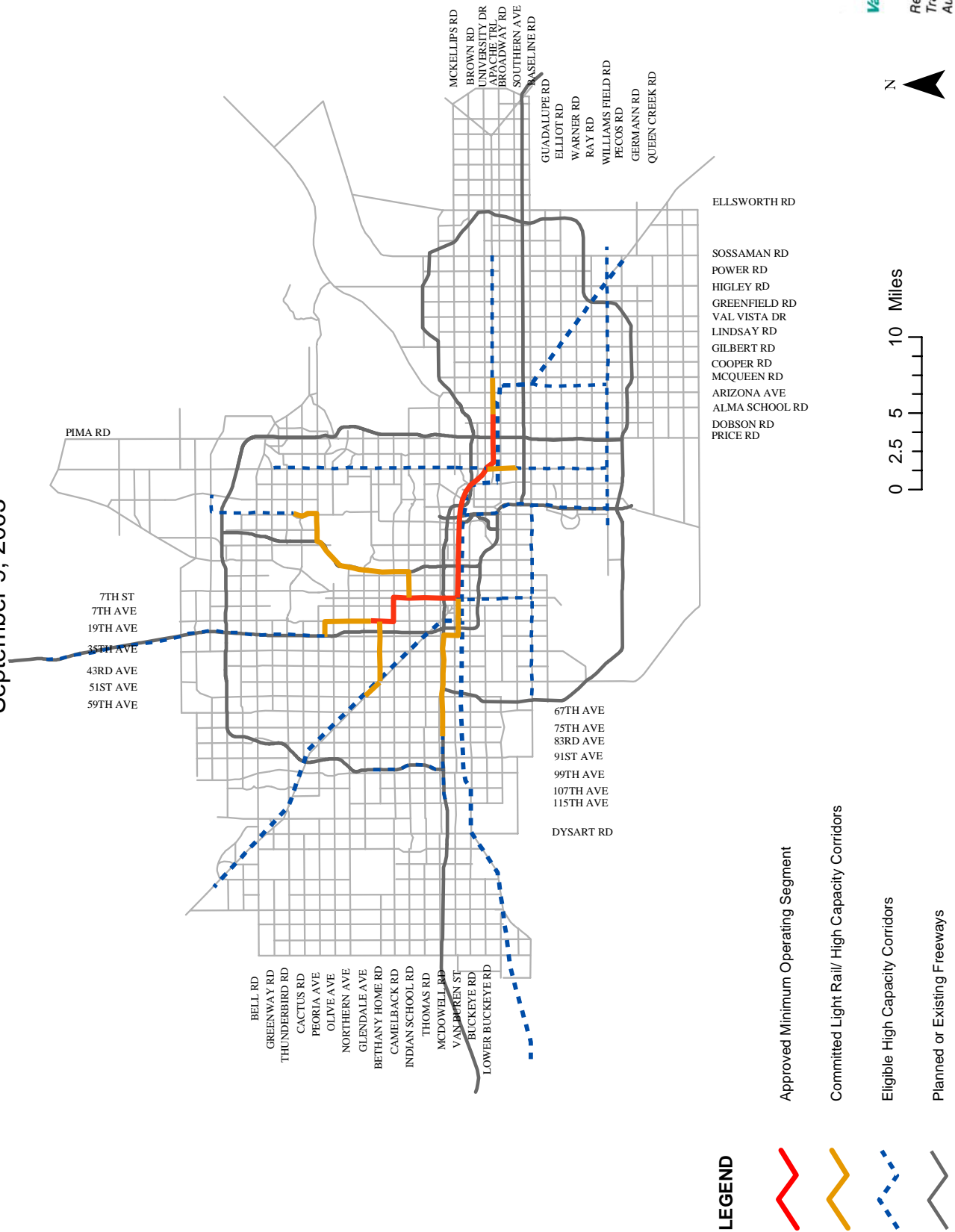
Additional transit facilities and services in the study area will clearly be necessary. Figure 3-30, taken from the *Regional Transportation Plan Final Draft Summary Report* approved by MAG's Transportation Policy Committee and Regional Council in September 2003 shows a number of high capacity transit corridors in the SWATS area. The figure shows the I-10 corridor west of the light rail line currently under construction to 79th Avenue as a corridor to which high capacity transit is committed. Other eligible corridors in the SWATS area where some type of high capacity transit such as bus-rapid-transit, light rail, or commuter rail is to be considered include:

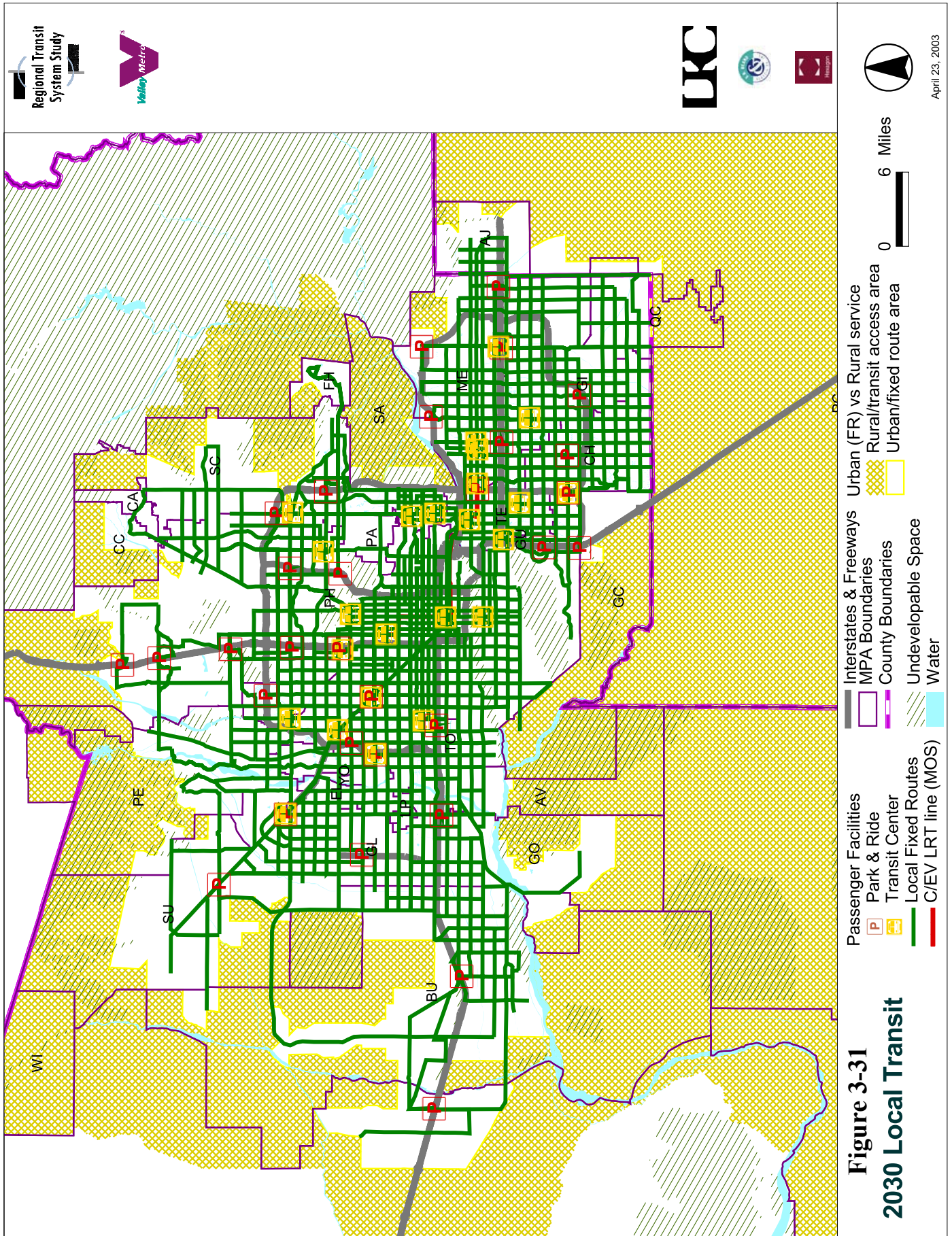
- I-10 west of 79th Avenue to 115th Avenue;
- Loop 101 north of I-10 to Bethany Home Road; and
- The Union Pacific Railroad west of downtown Phoenix to Buckeye.

The "Bus Rapid Transit Map" from the same document shows potential bus-rapid-transit routes along I-10, Loop 101, and Loop 303 in the SWATS area. The Regional Public Transportation Authority's (Valley Metro's) *Regional Transit System Study* shows expansion of local transit service west of the White Tank Mountains by 2030. Figure 3-31 includes local bus services west of the Hassayampa River in the I-10 corridor. Additional park-and-ride facilities are also shown along I-10.

Automatic vehicle location (AVL) technology is currently in place on 68 of the RPTA's buses. This number will increase as additional bus purchases take place, until the fleet is fully equipped. MAG's *ITS Strategic Plan* provides that transit operations in the study area will have a full complement of ITS applications that will enhance passenger safety and convenience. Access to real-time transportation information on major roads and transit services in Arizona have already been implemented via the 511 automated telephone answering system. Other anticipated ITS applications in transit include real-time bus arrival information at bus stops.

Figure 3-30
IDENTIFIED HIGH CAPACITY CORRIDORS
 September 9, 2003





3.1.3 Non-Motorized Transportation System

This section provides a description of the facilities available for use by non-motorized forms of transportation. These forms predominantly include walking, biking, skating, and horseback riding and cover trips for business, errands, recreation, fitness, connections to other modes, and other types of trip making. The section summarizes the non-motorized plans and policies of numerous jurisdictions affecting the study area. Data were gathered from MAG, the Arizona Department of Transportation (ADOT), Maricopa County Department of Transportation (MCDOT), local jurisdictions, and fieldwork.

3.1.3.1 General Description of Non-Motorized Systems

Typical origins for non-motorized travel in the SWATS area are population centers, residential areas, transit stations, resort areas, or access points for backcountry travel. Regional destinations for non-motorized travel are end points from origins such as schools, employment centers, concentrations of retail or tourist facilities, regional recreational centers and trailheads, and historic or cultural attractions.

Human-powered transportation occurs on shared-streets, streets with bike lanes, streets marked as bike routes, sidewalks, multi-use paths built on separate right-of-way, and multi-use trails that built on separate right-of-way.

In general, all streets are open to cyclists and pedestrians, unless specifically designated and posted otherwise. Therefore, the street grid provides the basic access and connections for bicycle and pedestrian travel. Most jurisdictions have addressed the needs of the non-motorized public on their street grid. This study only briefly assesses the existence of plans and facilities within the urban areas. Because of its regional nature, the SWATS focuses on the potential or actual connecting routes between them.

Planning for bicycle transportation can be approached as conventional transportation planning, i.e., where the same factors of access, convenience, safety, cost, efficiency, travel demand, connections, and engineering considerations all should apply. Integration of motorized and non-motorized transportation is a critical element of successful planning and design. This applies whether the non-motorized facility is on- or off-street. For optimum outcomes, such integration needs to be accomplished in the earliest planning stages. The following terminology is useful in the presentation of non-motorized transportation.

- **Bicycle Facility:** Denotes provisions and/or improvements made to accommodate or encourage cycling, including all bikeways, shared-streets, parking provisions, and signing.
- **Bicycle Lanes:** Bike lanes are a part of the roadbed, a minimum of 4 feet in width exclusive of the gutter pan, and are adjacent to the curb and gutter. Bike lanes by law are one-way, so a bike lane is needed on each side of the roadway. Specific national and local standards exist for striping, marking and signage.
- **Bicycle Route:** Any combination of paths, lanes, trails or streets that is designated by mapping or signing as a travel route for alternate modes. These facilities may be exclusive for non-motorized users or be shared with all transportation modes.
- **Bikeway:** See Bicycle Route. Bikeways may or may not be signed and may or may not be mapped.
- **Grade Separation:** Vertical isolation of travelways achieved with underpasses, overpasses, or

bridges. Usually applied to the intersections of paths or trails with streets to avoid interactions between motorized and non-motorized modes.

- Multi-use Path: A paved path, typically 10 feet in width, of concrete or asphalt material, preferably in a greenway or natural setting, well-separated from busy streets.
- Off-Road Facilities: Multi-use paths, shared-use trails, sidewalks, etc., that are not a part of a roadway.
- Pedestrian Facilities: Physical infrastructure that supports walking as a stand-alone mode of travel, or supports walking between origins and destinations such as a transit hub.
- Shared-Streets: Essentially any street open to cyclists. In most locales, all streets are open to cyclists except where specifically posted by local ordinance. Preferential striping or signing, or extra pavement width may or may not be present.
- Shared-Use Trail: Designates a “soft-surface” trail suitable for use by equestrians. Typically shared with other non-motorized users who don’t require a hard surface for travel.

3.1.3.2 Origins/Destinations

In the SWATS study area there are origin/destination pairs present in both the urban and rural areas, with the urban routes linking the pairs identified. In some cases, the routes have been well developed by various jurisdictions. The rural routes are less well identified (although not less used). Each of the urban areas in the study area serves as a potential origin for pedestrians and bicyclists. Destinations are listed for pedestrian activity, cyclists, and equestrians. Figure 3-32 shows the major regional non-motorized facilities in the SWATS area.

Avondale

Avondale has implemented bicycle lanes on certain streets, and the City of Avondale General Plan includes a Bicycling Element, as well as policies concerning pedestrians and non-vehicular transportation. The city has a retail and craft-oriented Pedestrian Zone that has been designated and built on Western Avenue, between Central Avenue and Dysart Road.

Buckeye

The Town of Buckeye is working on a *General Development Plan*. The downtown area has sidewalks in some sections, but there are no specific facilities for cyclists or areas for pedestrians.

Goodyear

The City of Goodyear has a *General Plan* that addresses pedestrian facilities, and has implemented a study and first phase construction to improve pedestrian facilities on Litchfield Road, Western Avenue, and Yuma Road. Goodyear has a bicycle route on Dysart Road. The *City of Goodyear General Plan, 1998*, includes a bicycle plan with designated routes.

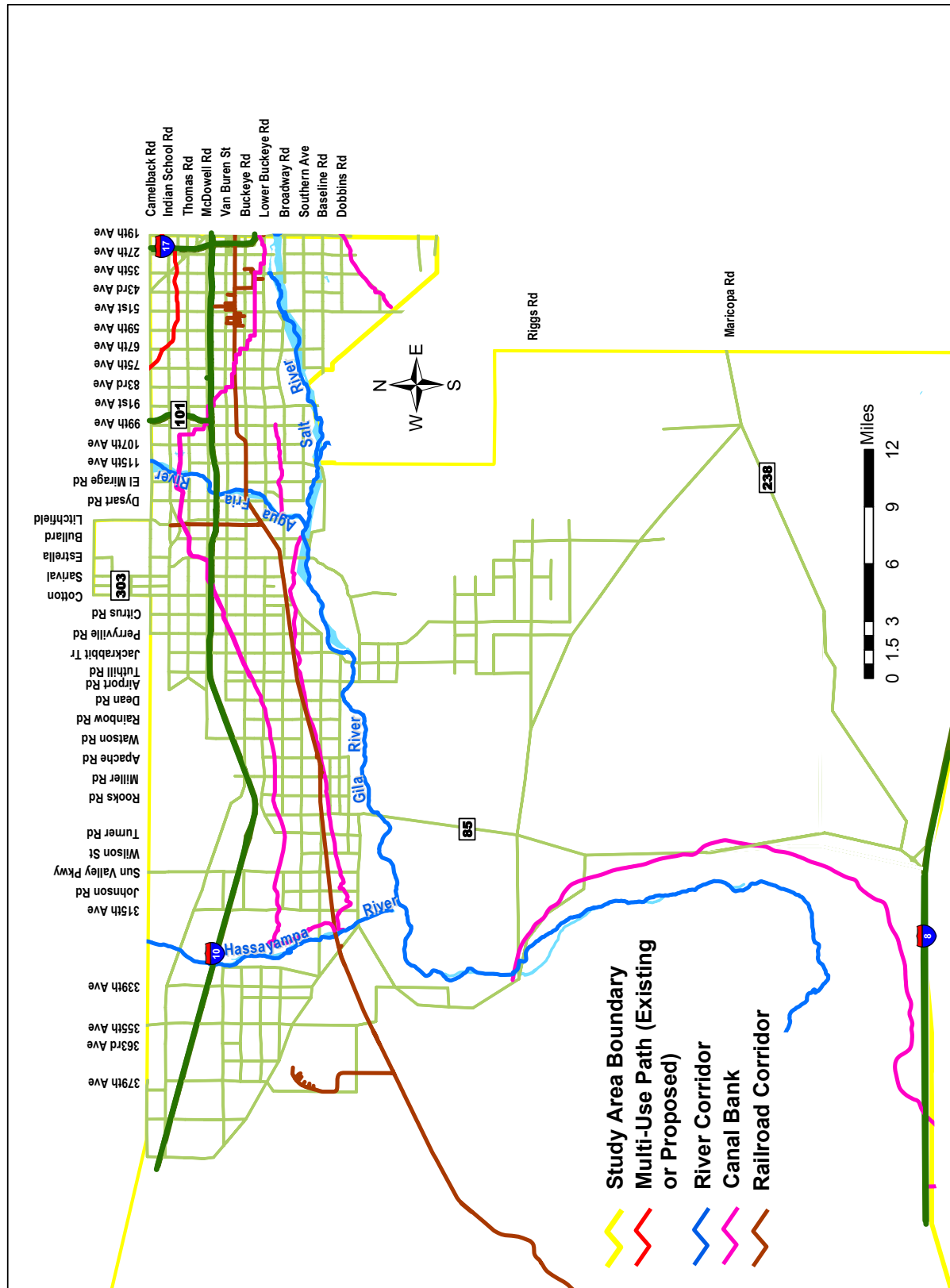
Litchfield Park

Litchfield Park has a designated retail downtown area, with many local destinations, canopy shade structures, and a thematic design to enhance the pedestrian environment. The city has implemented a system of multi-use paths, but there are no general policies concerning cycling and walking.

Southwest Phoenix

The City of Phoenix is divided into 14 urban villages. The following villages lie entirely or partly within the SWATS area: Ahwatukee Foothills, Estrella, Laveen, and South Mountain. Policies

Figure 3-32
Existing Off-Road Non-Motorized Facilities



regarding pedestrians and alternative transportation are addressed at the urban village level, as well as in the Phoenix General Plan. There is an existing paved, multi-use trail along the Western Canal.

Tolleson

Tolleson has work in progress to make Van Buren Street through the center of town more “pedestrian friendly.” The city has no bicycle facilities at present.

Rural Areas

Outside of the urban areas, the SWATS study area is largely undeveloped. The number of miles of paved streets in the undeveloped areas is low; however there is an extensive network of dirt or gravel roads, canal banks, and dry washes that can be used by pedestrian, equestrians, and bicyclists. There are a variety of facilities and amenities for hiking and biking throughout these areas.

Gila Bend

The Town of Gila Bend has sidewalks along the curb on the main street, no bike lanes, and a 25-mph speed limit. Horse properties are in evidence. Gila Bend has a Town Museum, an airport and all facilities for a rest stop.

Sentinel

Sentinel is a very small town with a little general store, and a café closed in summer. There is no evidence of bicycle or pedestrian facilities.

Tonopah

Tonopah has no specific bicycle or pedestrian facilities at this time, but does have facilities for a rest stop.

Recreational and Cultural Areas

Many points of interest lie throughout area, such as wilderness areas, recreation areas, national monuments, mines, old towns, mountain ranges, natural washes, hot springs near Tonopah, etc. Most are accessible only by foot, off-road vehicles, mountain bikes, or horses. The Sonoran Desert National Monument can be accessed by a gravel road going south from SR-8, near Freeman. This road is suitable for hikers, mountain bikes, and horses.

The Town of Agua Caliente can be reached from the Old Agua Caliente Road running north from Sentinel. This apparently deserted town has a pioneer cemetery and interesting old buildings. The area in general has rolling terrain, views of Hyder Valley, and lava fields. The paved road stops near the Union Pacific Railroad tracks, a few miles north of the Town of Agua Caliente.

Following Painted Rock Road north from SR-8 leads to the Painted Rock Dam, through scenic, rolling terrain that ascends into the Painted Rock Mountains and offers views of Citrus Valley. The road is a fairly rough chip seal, and there are no public facilities at the dam, except hiking trails.

The BLM Rocky Point Campground and Petroglyphs contains an outstanding area of petroglyphs. The camp, ½ mile off Painted Rock Road, has shade, restrooms, and camping spaces, but no water.

Cotton Center Road (Old US 80) crosses the Gillespie Dam on the Gila River. Restoration work is planned for this historic iron bridge. The Arlington Wildlife Area is nearby.

For equestrian and mountain bike use, hiking, jogging, and recreational walking, unpaved surfaces are preferred. Routes along corridors with unpaved shoulders on roadways, canal banks, utility

corridors, natural washes, etc., can provide excellent routes for these users. The following are of particular interest in the SWATS area:

- The Gila Bend Canal banks, from approximately Piedra east to Gila Bend and then north to the Arlington Canal near Arlington Valley.
- The power line corridors shown on Figure 3-32, including those from the Enterprise Canal past the Woolsey Peak Wilderness and from the Laveen area into the Gila River Indian Reservation.
- The Roosevelt Canal banks, from the Hassayampa River near the Buckeye Municipal Airport, east to New River and the Grand Canal.
- The Buckeye Canal banks, from the Hassayampa River, near Hassayampa. This canal roughly parallels the south side of the Union Pacific Railroad tracks, goes through the Town of Buckeye, and ends at the Agua Fria River, near the north side of the Estrella Mountain Park.

No rail-to-trail conversions of old railroad corridors were found in the study area.

3.1.3.3 Non-Motorized Transportation Policies and Planning

Typically, the larger incorporated urban areas in Maricopa County have developed policies and implemented capital projects to encourage travel by bicycle or on foot. Thus, in addition to the shared-streets, they have put in place specific facilities for cycling and pedestrians. Some of these are part of the roadway, such as bike lanes. Others are off-road, such as multi-use paths, and shared-use trails.

The State of Arizona, Maricopa County, and the Maricopa Association of Governments have developed specific policies and facilities for cyclists and pedestrians. Major documents are briefly described below.

Arizona Department of Transportation

On the Arizona Bicycle Map, written by the ADOT and the Governor's Bicycle Task Force, state and federal roads are identified as "more suitable" or "less suitable" for cycling. I-8 and Old US 80 are rated as "more suitable", while SR-85 is rated as "less suitable."

ADOT has also produced a policy document for bicycle planning and accommodation, the Arizona Statewide Bicycle/Pedestrian Plan. This plan is currently undergoing revision. ADOT Policy has been to allow bicycle travel on all roadway shoulders, except where expressly prohibited in urban areas. Another effort between ADOT and stakeholders is an attempt to resolve design issues for "rumble strips" on highway shoulders, because the presence, design, and implementation of these warning devices can seriously impact the rideability of a shoulder.

Maricopa County

The *Maricopa County 2020 Transportation System Plan, Eye to the Future* designates certain roadways as "scenic and recreational." This designation identifies the need to minimize impacts to the roadway and to preserve the natural characteristics of a road's environment. The plan recognizes a roadway's importance in providing access to recreational facilities. Identified corridors within the SWATS study area are Agua Caliente Road, Painted Rock Road, and Cotton Center Road.

The Maricopa County Flood Control District, with most of the west valley towns, is in the process

of preparing a policy for recreation corridor links that would utilize their flood control facilities for off-street multi-modal transportation.

MCDOT urban street sections do not currently require bicycle lanes, but optional standards for both urban and rural cross-sections with bike lanes are included. The current *Transportation System Plan* recommends that the *MCDOT Roadway Design Manual* be amended to include urban cross-sections that incorporate on-road bicycle lanes as the recommended design standard, as opposed to being an optional treatment.

The *Maricopa County Department of Transportation (MCDOT) Bicycle Transportation System Plan, 1999*, addresses all aspects of bicycles as a transportation element, including recommended improvements and a plan for a countywide bicycle network.

Within the SWATS study area, the *MCDOT Bicycle Plan* designates certain sections of Old US 80, Salome Highway, Courthouse Road, 335th Avenue, Palo Verde Road, Baseline Road, Estrella Parkway, 51st Avenue, Dobbins Road, Cotton Lane, SR-85, Lower Buckeye Road, Dysart Road, and 99th Avenue as parts of a proposed bicycle network.

All county roads are open to bicycling. A number of paved roads are noted as being of particular interest to cyclists.

- Agua Caliente Road from the Town of Sentinel to Old Agua Caliente Road. The pavement ends a few miles north of the ghost town, near the Union Pacific Railroad tracks.
- Painted Rock Dam Road from I-8 (about Piedra) to the Painted Rock Dam, where the pavement ends.
- Salome Highway to Courthouse Road to Harquahala Valley Road. These roads form a connection from Cotton Center Road (Old US 80) to I-10 at Exit 81.
- Cotton Center Road (Old US 80) from the Town of Gila Bend to the area of Hassayampa and the Town of Buckeye.
- Watermelon Road, Citrus Valley Road, and Cotton Center Road form a loop in the area just north of Gila Bend suitable for cycling.
- A frontage road on the south side of I-8 from the Town of Gila Bend west to Painted Rock Road. Construction is underway to continue this frontage road to Sentinel.
- CR-85 from SR-85 (Olgesby Road) to downtown Phoenix. This connects Buckeye Road, Lower Buckeye Road, Broadway Road, Baseline Road, and Dobbins Road. Overall, these roads provide connections among southwest Phoenix, Avondale, Goodyear, Buckeye, South Mountain Park, and Estrella Mountain Park.

Transit Connections

In the SWATS study area, Greyhound has bus routes on I-8 and I-10. Cities served with Ticket Centers and/or Limited Service Bus Stops are Phoenix, Tolleson, Buckeye, and Gila Bend. Valley Metropolitan, all of whose buses have bike racks, operates the following routes that provide connections within the SWATS study area:

- Route 560 – Avondale Express, connecting central Phoenix with Avondale and Tolleson.
- Route 3 – Van Buren Street and the Green Line along Thomas Road, both connecting central Phoenix with points to the west in the vicinity of Avondale and Tolleson.
- Route 13 – Buckeye Road, connecting Phoenix out to 75th Avenue and providing a means

to make part of a trip west by bus.

Maricopa Association of Governments

The Maricopa Association of Governments (MAG) identifies off-street corridors suitable for multi-use paths such as canals, power line corridors, and river and wash corridors in the *Regional Off-Street System Plan, 2001* and *Phase 1, 2002* documents. Corridors in the SWATS study area include:

- The Agua Fria River Corridor, extending from its junction with the New River to the Gila River. This would connect Estrella Mountain Regional Park with a large area of Southwest Phoenix and other nearby communities.
- The Gila River Corridor, from its eastern junction with the Agua Fria River to its western connection with the Hassayampa River. At that junction, the corridor turns north and follows the Hassayampa River.

The *MAG Regional Bicycle Plan, 1999*, covers all aspects of planning for bicycling in the MAG region. A “Regional Bikeway Plan On-Road System Inventory” is presented, including potential facilities and recommendations for widening and/or striping. In the SWATS study area the following have been identified:

- Route 11, Cotton Lane between Buckeye Road and extending to Olive Avenue (outside of study area).
- Route 15, Litchfield Road from Estrella Mountain Park to Bell Road (outside of study area).
- Route 19, 91st Avenue from Buckeye to Glendale (outside of study area).
- Route 20, Baseline Road and Hardy Road from 51st Avenue to Power Road (outside of study area).
- Route 23, 51st Avenue south from Bell Road to Riggs Road. The section of Route 23 between Camelback Road and the Gila River Indian Reservation is in the SW Study Area.
- Route 26, Buckeye Road, beginning at SR-85, to study area boundary at 19th Avenue. Eventually Route 26 reaches Tortilla Flat.
- Route 29, 31st Avenue south from Union Hills Road to Washington/Jefferson, and thence to the study boundary at 19th Avenue. At 17th Avenue, Route 29 joins Route 26.
- Route 31, 23rd Avenue from Washington to Dunlap (outside of study area), and then follows 19th Avenue to Union Hills Drive.
- Route 44, follows Encanto Boulevard from 91st Avenue to 31st Avenue.
- Route 64 starts at SR-85 west of Buckeye, and follows the Sun Valley Parkway (outside of study area) around the White Tank Mountains to Bell Road.

Roadways within the study area that may be good candidates for bike facilities include:

- Jackrabbit Trail – between Olive Avenue and MC85.
- Cotton Lane and Loop 303 – from north of the study area boundary south to I-10.
- Dysart Road – from CR-85 north to the study area boundary.
- 99th Avenue – between I-10 and Baseline Road.
- 59th Avenue – north of I-10 to the study area boundary.
- 19th Avenue – from Baseline Road north to the study area boundary.

- Sun Valley Parkway – from I-10 north to the study area boundary.
- Indian School Road – from Jackrabbit Road east to the study area boundary.
- Maricopa County 85 – between SR-85 and I-17

Summary of Current Facilities, Policies, and Planning

Urban centers and larger jurisdictions such as the City of Phoenix and Maricopa County have facilities, policies, and plans generally supportive of building and acquiring bicycle routes. Pedestrians are better served in smaller communities such as Litchfield Park, Goodyear, and Tolleson's commercial areas. Smaller communities have few specific facilities for bicycle travel, but use of shared streets may be adequate for most purposes where vehicular traffic is light. Other jurisdictions and agencies show a need for policies, plans, and budgeting to encourage cycling and walking.

3.1.3.4 Future Non-Motorized Deficiencies

For non-motorized uses, physical deficiencies most often take the form of gaps in the route or system and barriers within the route itself. Pedestrian areas are generally present and adequate in most communities' central business districts, with improvements funded by various grants. Recreational walking and hiking have been planned in most jurisdictions.

Policy and planning deficiencies are most often found in requirements for bicycle transportation on-street and in budgeting priority. For pedestrians, the most common deficiency is recognition of walking as a mode of travel, other than recreational walking.

Gaps

Gaps can take the form of missing corridors, missing pieces of within a corridor, and missing connections between on-street and off-street facilities. Gaps between cities and rural areas have been identified in Figure 3-33. As the figure shows, gaps in existing and planned bicycle facilities are found in both the on-street and off-road categories.

Several arterial streets have gaps within a jurisdiction's planning area and between jurisdictions. Examples are:

- Baseline Road, from Southern Avenue to the Salt River;
- 2nd Avenue, from Buckeye Road to Encanto Boulevard; and
- Perryville Road, from McDowell Road to the Salt River.

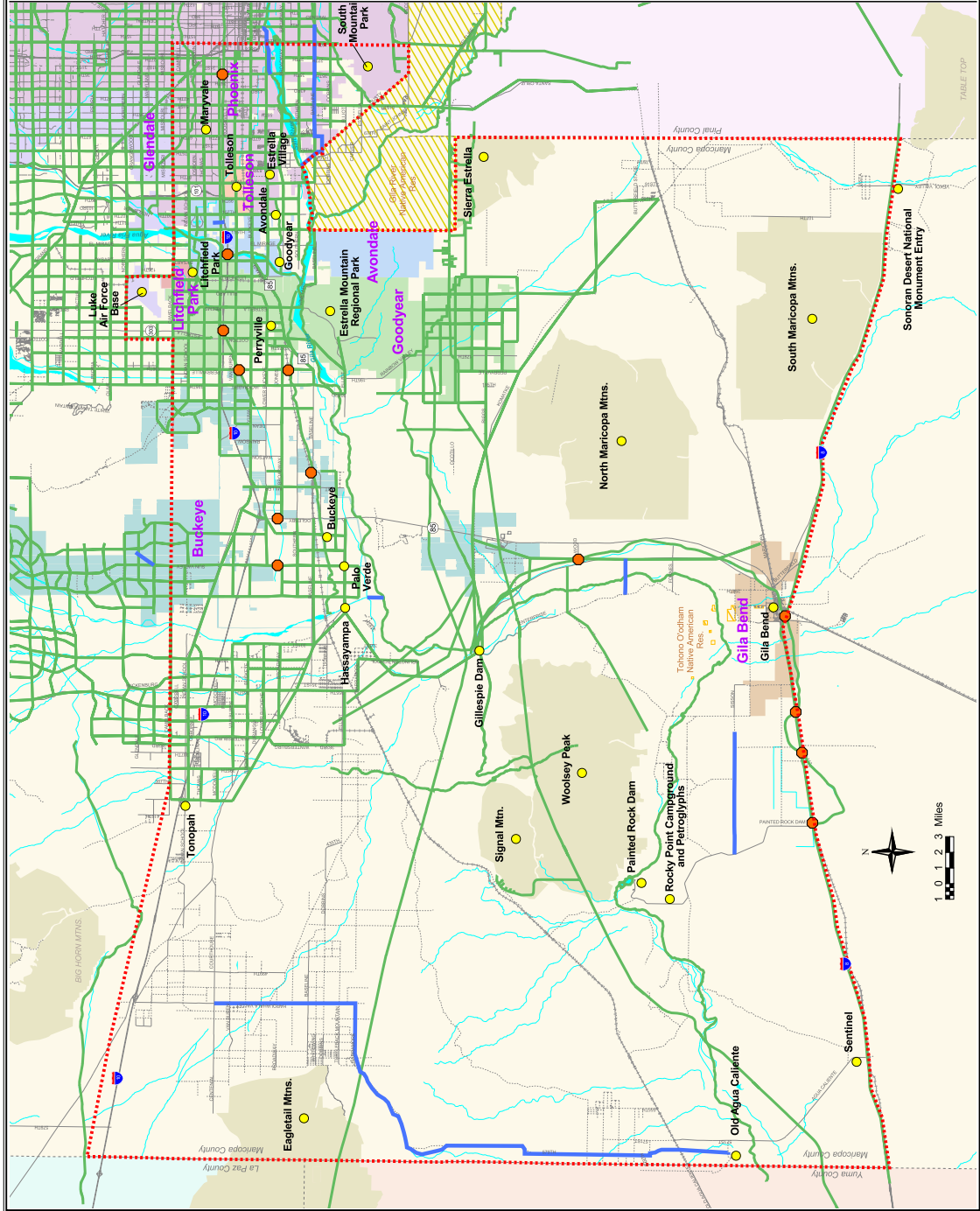
Several jurisdictions have planned for the Salt, Gila and Hassayampa Rivers to be an off-road non-motorized facilities. However, gaps occur in connecting these corridors to each other and the nearby arterials and other paved streets. Missing connections include:

- Lower Buckeye to the Salt River Corridor;
- The Hassayampa River to the Salt/Gila Rivers corridor; and
- SR-85 to the Gila River.

Along I-10 there is a gap between where it is permissible to ride on the shoulder and other local bike routes. There should be a connection between I-10 and an existing bicycle facility. Paved paths are needed for Sisson, and from Agua Caliente to the Harquahala Valley Road. The existing powerline

- Gap
- Barrier
- Existing Route
- Destination
- Study Area Boundary

Source: Maricopa Association of Governments,
Logan Simpson Design



corridors just north of the study boundary should be connected.

Barriers

Barriers at a regional scale are usually present when an off-road or on-street facility comes up against a canal, riverbed or wash, freeway, or elevated railroad crossing. In the southwest region, barriers can be found at the intersections of:

- Paved routes and the UPRR;
- Arterial Streets and canals;
- Paved paths and I-10 and I-8; and
- Residential and commercial areas across SR-85 in Gila Bend.

Deficiencies in Policies and Planning

Planning for non-motorized transportation should be approached as conventional transportation planning, where the same factors of access, convenience, safety, cost, efficiency, travel demand, connections, and engineering apply. Integration of motorized and non-motorized facilities is a critical element of successful planning and design. This applies whether the non-motorized facility is on-street or off-road. For optimum outcomes, such integration needs to be accomplished in the earliest planning stages. Typically the larger incorporated urban areas in Maricopa County have developed policies and implemented capital projects to encourage travel by bicycle or on foot; so, in addition to the shared-streets, they have put in place specific facilities for cycling and pedestrians. Some of these are part of the roadway, such as bike lanes and sidewalks. Others are off-road, such as multi-use paths and shared-use trails.

Similarly, additions to the arterial grid network, improvements to existing arterials, and upgrades of a lower street classification to an arterial street should include buffered sidewalks bicycle lanes where feasible and where they can be made part of a regional system. These are not yet requirements.

At their destinations, recreational bicycle or equestrian travel groups will need facilities such as parking, water, shelter, and storage. Nodes such as these have not been identified.

Pedestrian policy is regulated at a federal level for access by the Americans with Disabilities Act (ADA) and its Accessibility Guidelines (ADAAG), but a policy for locating pedestrian areas other than recreational trails and multi-use paths, such as enforcement of a Safe Route to School, was not found at the state, county, or local levels. Similarly, while many communities have at least a role for a Bicycle Coordinator, no corresponding role was found for a Pedestrian Coordinator.

Pedestrian planning on a regional basis should focus on transit connections between origins/destinations, with bicycle and bike-on-bus as an alternative. For a pedestrian-by-necessity traveling regionally, getting to their ultimate destination is currently very difficult.

Three rivers exist in the more populated northeasterly sections of the study area and include the Salt River, the Agua Fria River, and the Gila River. Bridges over rivers should always be designed to accommodate non-motorized travel.

3.2 Summary and Conclusions

The growth in the population and employment in the SWATS area and metropolitan Phoenix expected over the next 25 years will over-tax the capabilities of the existing transportation system, even with the additions included in the region's current Long Range Transportation Plan.

3.2.1 Roads and Highways

The LRTP based network includes facilities and services based on the Long Range Transportation Plan and other improvements expected in the future. Traffic forecasts for 2030 for that network show severe levels of congestion. East of Airport Road it is difficult to find an intersection of arterials in the SWATS area that is forecast to operate with an acceptable level-of-service during the peak hour. East of Watson Road it is almost impossible to find sections of east/west roadway forecast to operate without heavy congestion. Some north/south arterials in this same portion of the study area are expected to operate with acceptable levels of congestion, particularly south of I-10. Crossings of the Agua Fria River and of the Gila River west of the Agua Fria show substantial congestion. West of Airport Road and in southern Goodyear the arterial grid is forecast with more isolated locations of congestion.

Major increases in the east/west capacity of the arterial and freeway systems will be necessary to reduce forecast congestion to acceptable levels. These major capacity increases will need to extend from central Phoenix at least as far west as SR-85. Some increases in north/south highway capacity will be needed, particularly north of I-10 and across the Gila River into southern Goodyear. Thus, major increases bridge capacity will be required over the Gila River west of the Agua Fria. Increases in bridge capacity will also be required over the Agua Fria.

The number of motor vehicle accidents is forecast to more than double by 2030. Freeways, with their access controls and lack of intersections, provide a much higher level of safety per vehicle mile of travel than do arterials and other lower class roadways. A concentration of highway capacity increases in freeways will reduce the number of accidents forecast for the SWATS area.

3.2.2 Transit

The increased population and employment in the SWATS area is expected to result in extensive new development as far west as the Hassayamp River and in southern Goodyear south of the Gila River. As development moves west and south, the demand for transit service can be expected to move. Because of the greater distances involved in commuting to downtown Phoenix and to other locations in the metropolitan area, demand for higher speed transit is also expected.

Expansion of the service area for fixed route transit services is forecast west of the Hassayampa River and south into southern Goodyear. Higher speed and higher capacity services, such as light rail in the I-10 corridor, commuter rail along the Union Pacific tracks, and bus-rapid-transit in freeway corridors are among the options requiring further consideration as the southwest valley develops.

3.2.3 Non-Motorized Facilities

The system of bicycle, pedestrian, and multi-use non-motorized facilities in the SWATS area is incomplete. There are currently substantial gaps in the continuity of non-motorized facilities.

Bicycle and pedestrian facilities are not fully integrated into the improvement process for the arterial system. A more fully functional network of bicycle and pedestrian facilities in the SWATS areas will be realized with the inclusion of bicycle and pedestrian facility provision in the improvement of the arterial system. Additionally, major facility upgrades and improvements afford the opportunity to provide parallel improvements to bicycle, pedestrian, and multi-use non-motorized facilities. Bridges over the major rivers in the study area are an example of such an opportunity.

Numerous opportunities also exist for formal creation of multi-use facilities along river banks, canals, power lines, railroads, and other linear facilities to remove gaps in existing formal and informal facilities.. Multi-use trails and paths require a variety of support facilities such as parking, water, shelter, and storage.

Bikes on transit and bicycle facilities at transit stations currently provide for increased transportation options in areas served by transit. Improving pedestrian access to transit should focus on removing barriers to effective pedestrian/transit connections. Provision for these connections and for pedestrian circulation between residential areas and nearby activity centers can be accommodated in the arterial and land development processes.